

2017 ACCESSORIES & EQUIPMENT

Power Seats - CT6

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE:

All fasteners listed in this table can be reused after removal.

Application	Specification
	Metric (English)
Driver or Passenger Seat Adjuster Memory Module Fastener	2.5 N.m (22 lb in)
Driver or Passenger Seat Adjuster Switch Fastener	1.3 N.m (12 lb in)
Front Seat Adjuster Memory Module Bracket Fastener	2.5 N.m (22 lb in)
Front Seat Adjuster Memory Switch Bezel Fastener	2.5 N.m (22 lb in)
Front Seat Back Lumbar Bladder Fastener	10 N.m (89 lb in)
Rear Seat Adjuster Bolt	10 N.m (89 lb in)
Rear Seat Adjuster Memory Module Screw	4.5 N.m (40 lb in)
Rear Seat Adjuster Screw	10 N.m (89 lb in)
Rear Seat Lumbar Support Fastener	10 N.m (89 lb in)

SCHEMATIC WIRING DIAGRAMS

DRIVER SEAT WIRING SCHEMATICS

Power, Ground, Serial Data and Subsystem References

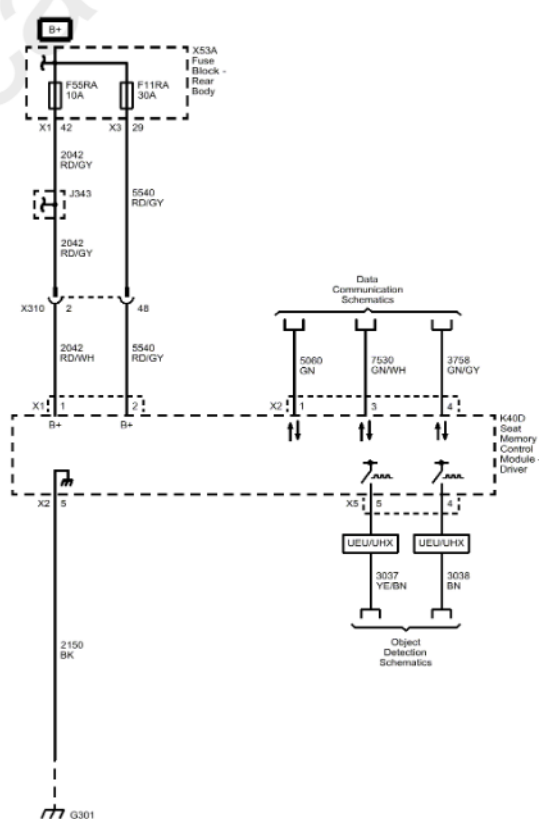


Fig. 1: Power, Ground, Serial Data and Subsystem References
Courtesy of GENERAL MOTORS COMPANY

Controls

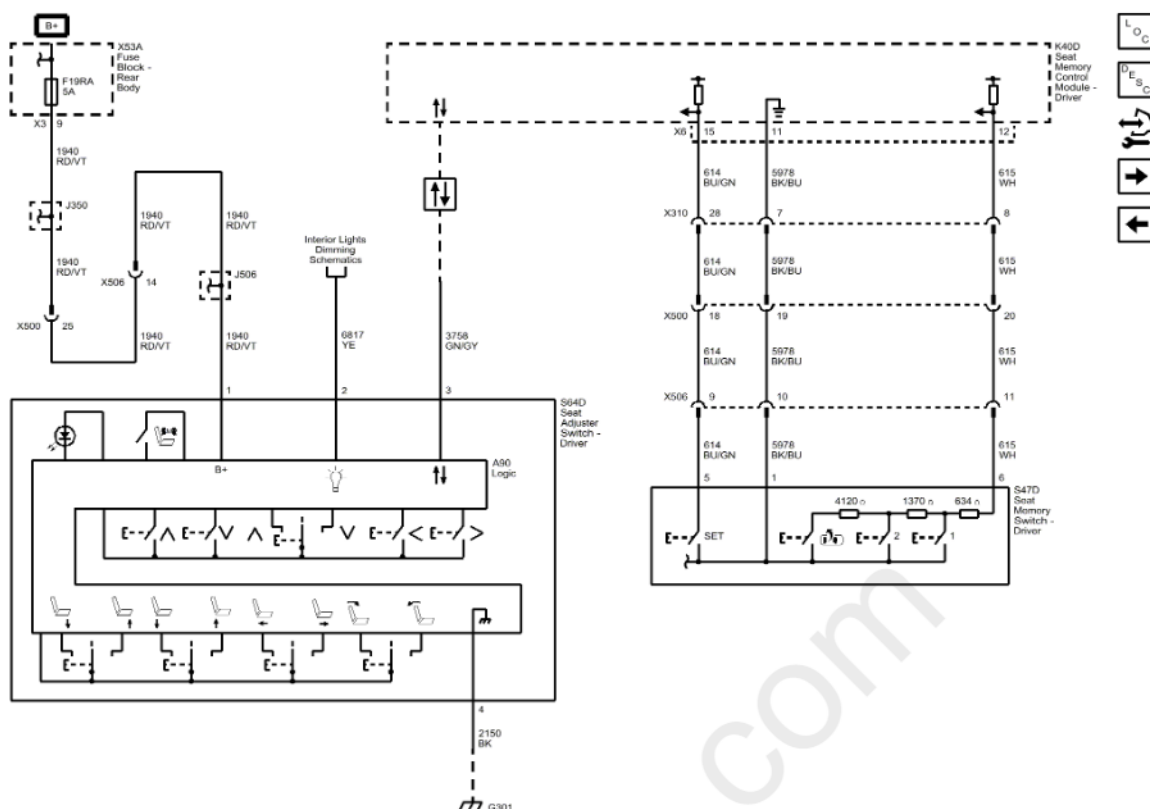


Fig. 2: Controls
Courtesy of GENERAL MOTORS COMPANY

Position Motors

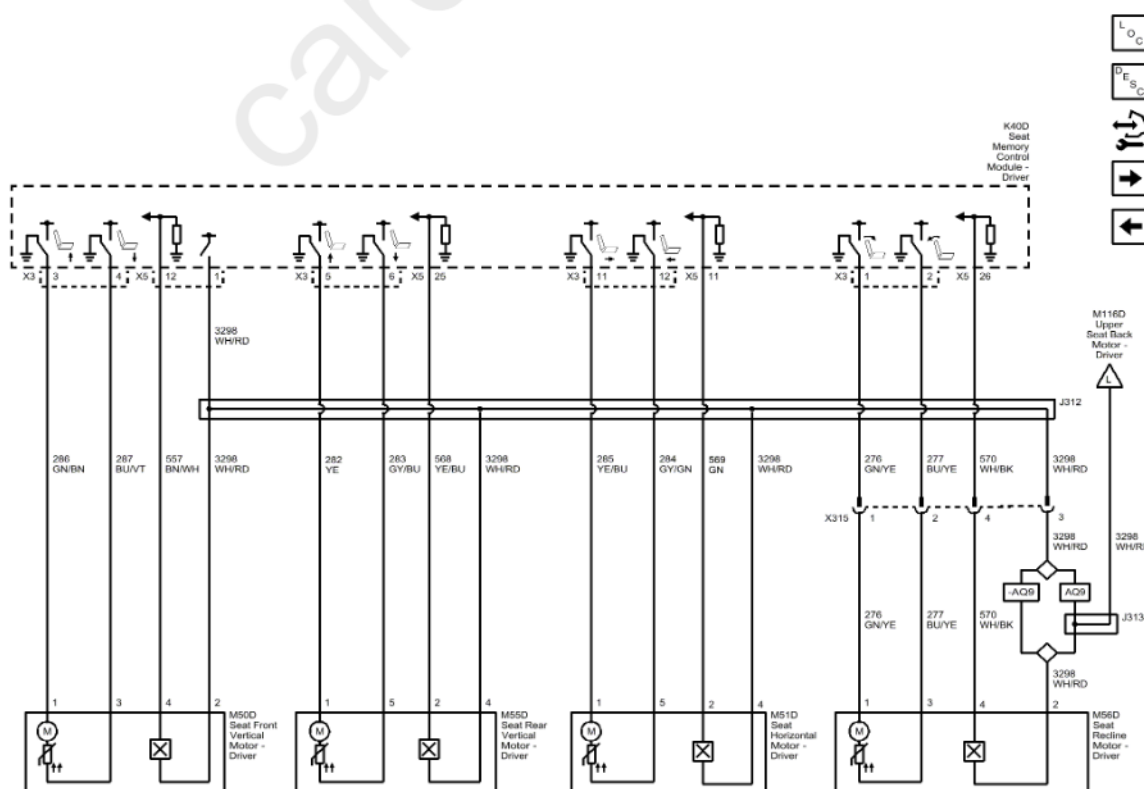


Fig. 3: Position Motors
Courtesy of GENERAL MOTORS COMPANY

Lumbar (AL2)

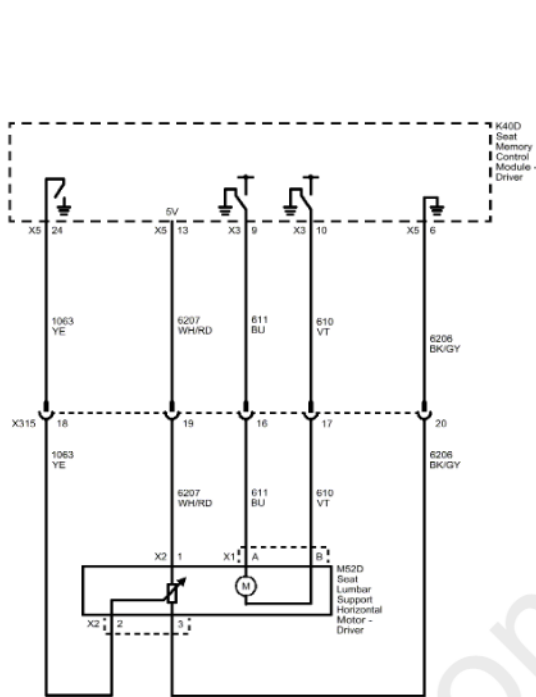


Fig. 4: Lumbar (AL2)
Courtesy of GENERAL MOTORS COMPANY

Lumbar (AQ9)

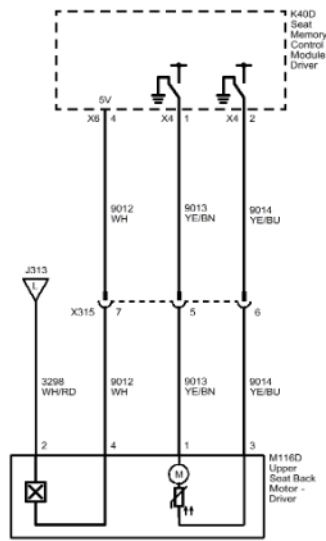


Fig. 5: Lumbar (AQ9)
Courtesy of GENERAL MOTORS COMPANY

Active Side Bolsters (AQ9/AL9)

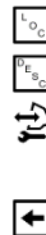
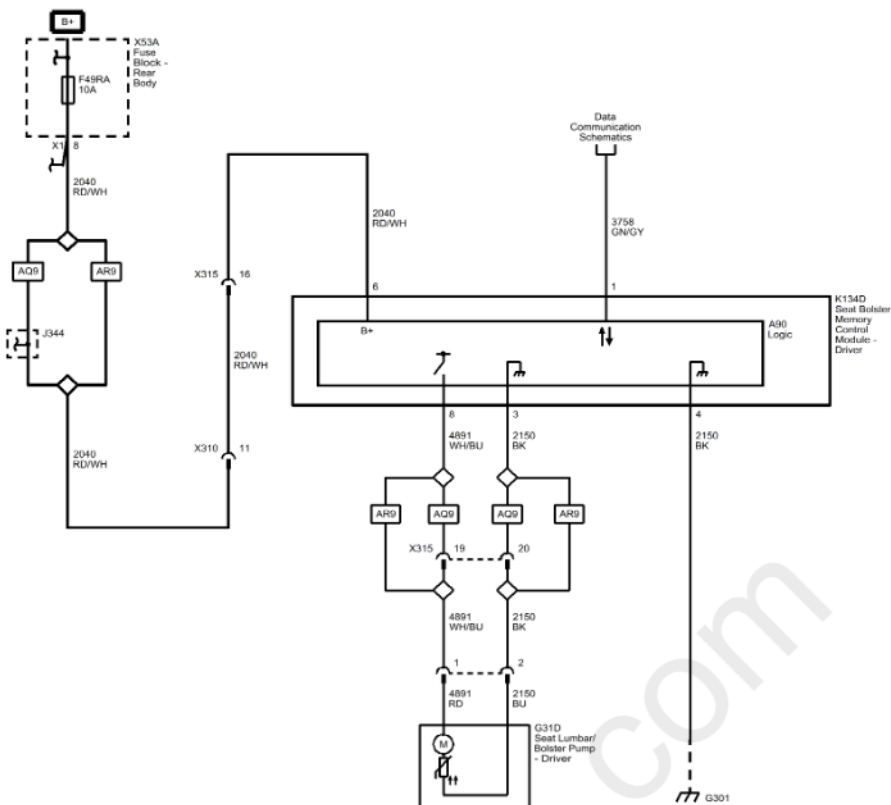
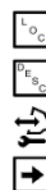
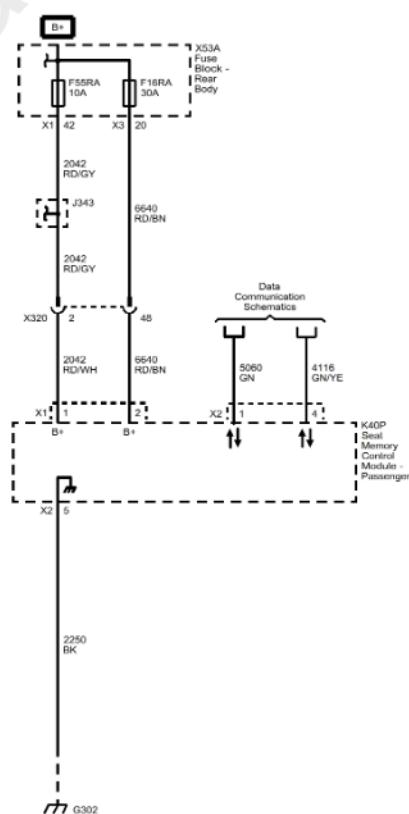


Fig. 6: Active Side Bolsters (AQ9/AL9)
Courtesy of GENERAL MOTORS COMPANY

PASSENGER SEAT WIRING SCHEMATICS

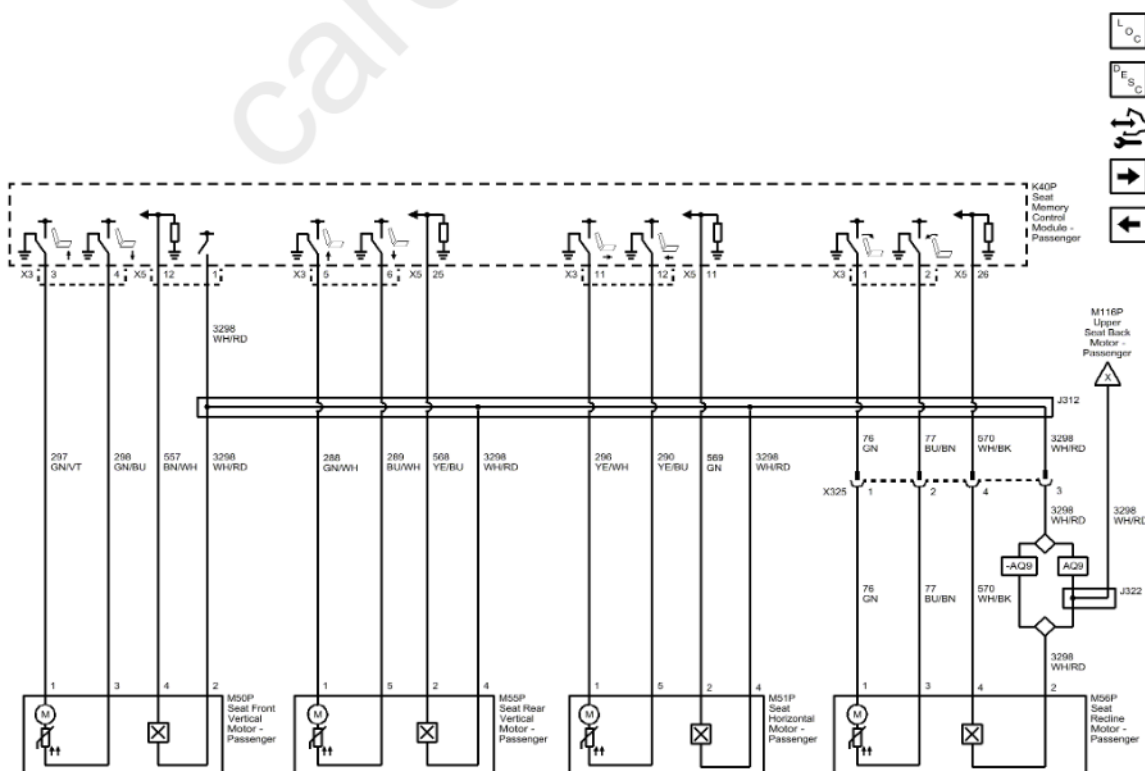
Power, Ground and Serial Data



Controls

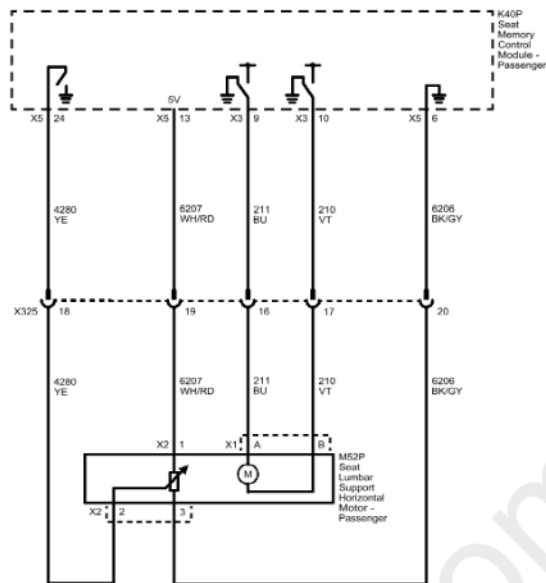


Position Motors



Courtesy of GENERAL MOTORS COMPANY

LOC
DESC
↕
→
←



Courtesy of GENERAL MOTORS COMPANY







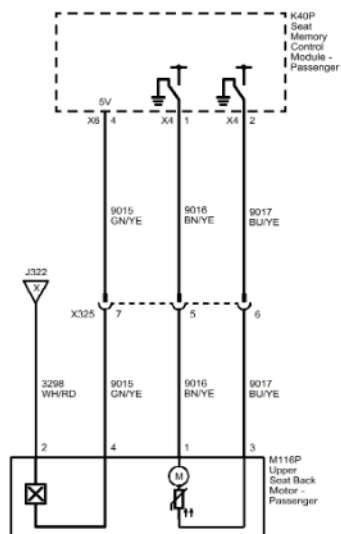


Fig. 11: Lumbar (AQ9)
 Courtesy of GENERAL MOTORS COMPANY

Active Side Bolsters (AQ9 or AL9)

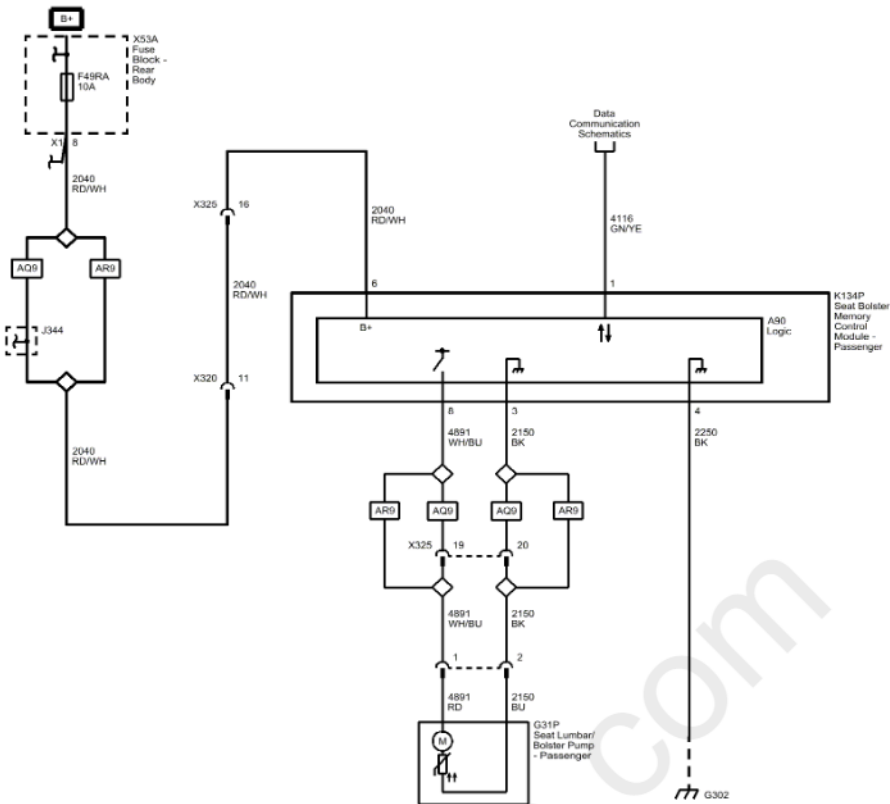


Fig. 12: Active Side Bolsters (AQ9 or AL9)
 Courtesy of GENERAL MOTORS COMPANY

REAR SEAT WIRING SCHEMATICS (AQ9)

Memory Module Power, Ground, Serial Data and Motors - Left Rear

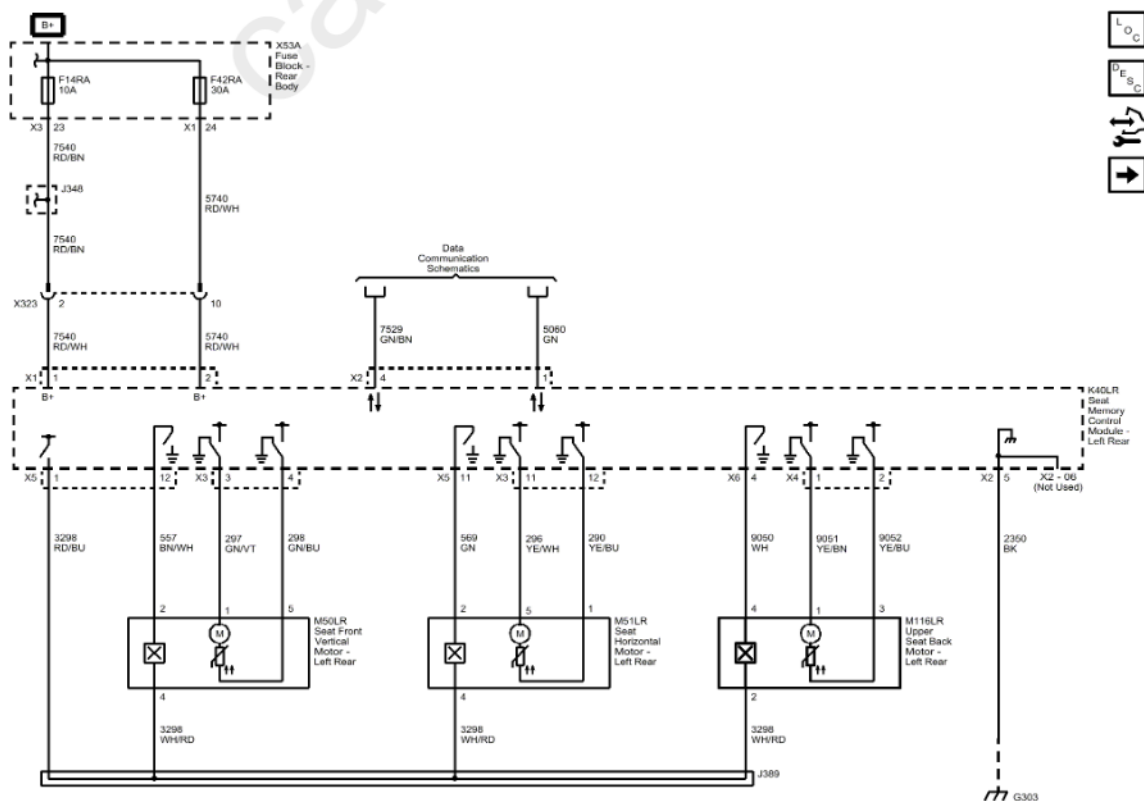


Fig. 13: Memory Module Power, Ground, Serial Data and Motors - Left Rear
 Courtesy of GENERAL MOTORS COMPANY

Memory Module Power, Ground, Serial Data and Motors - Right Rear

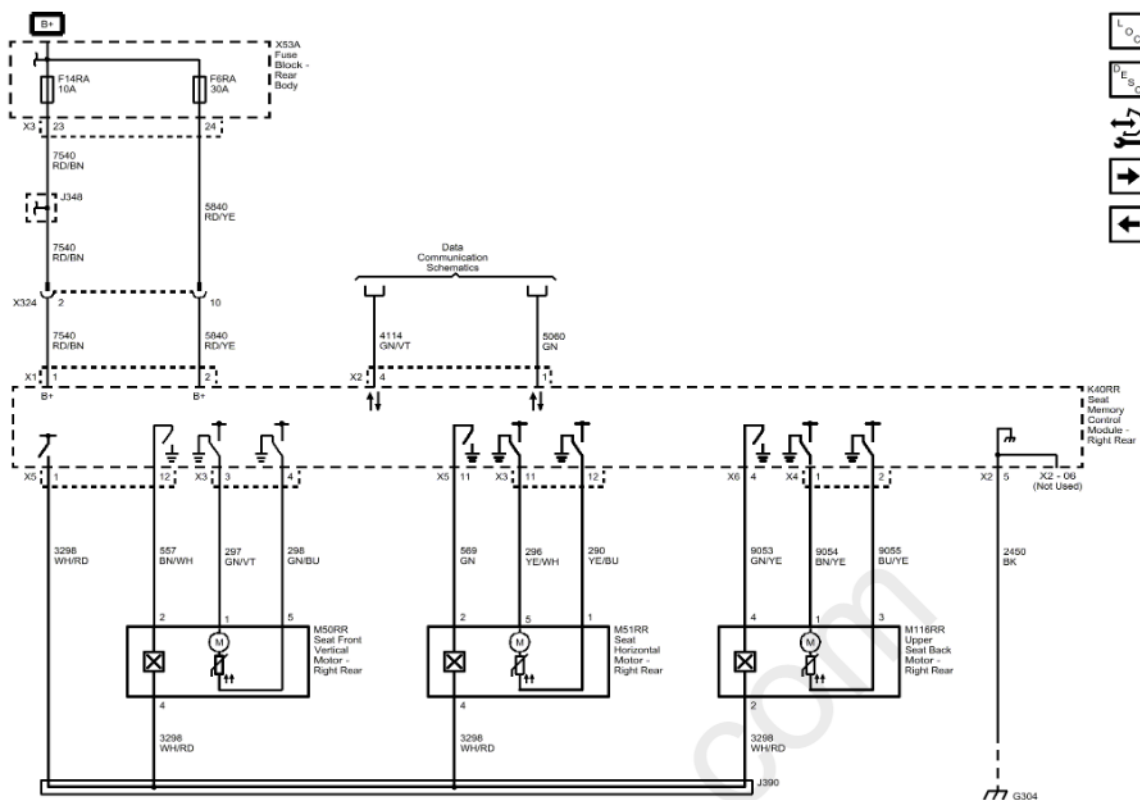


Fig. 14: Memory Module Power, Ground, Serial Data and Motors - Right Rear
 Courtesy of GENERAL MOTORS COMPANY

Seat Bolster Memory Control Modules

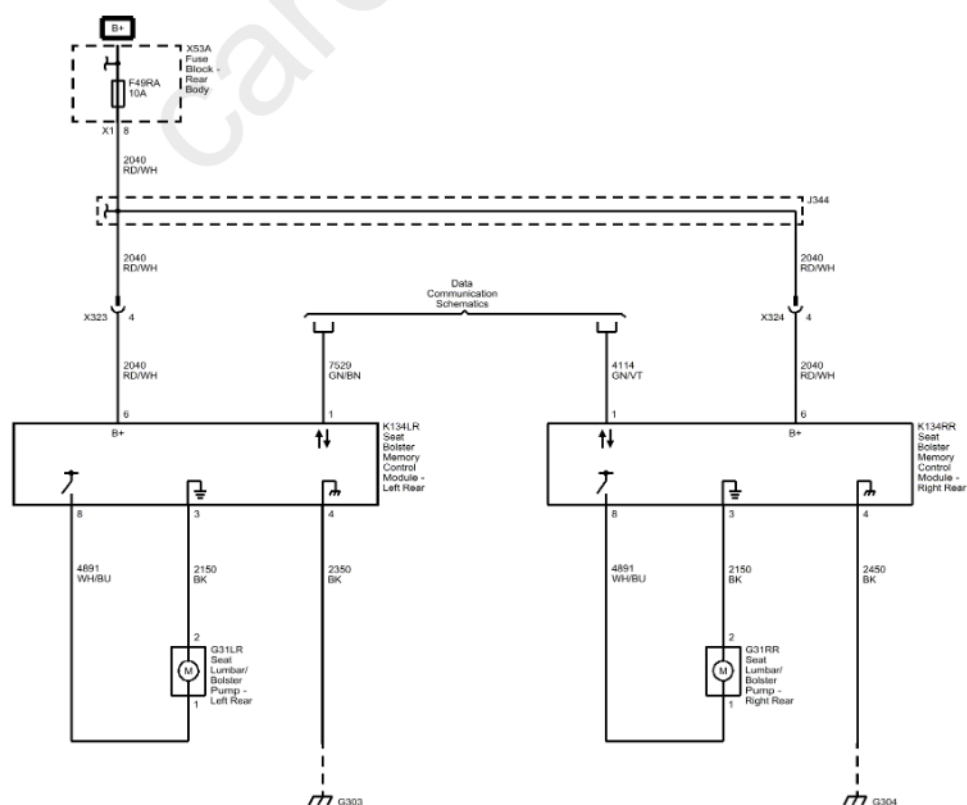


Fig. 15: Seat Bolster Memory Control Modules
Courtesy of GENERAL MOTORS COMPANY

Left Rear Seat Adjuster Switch and Controls

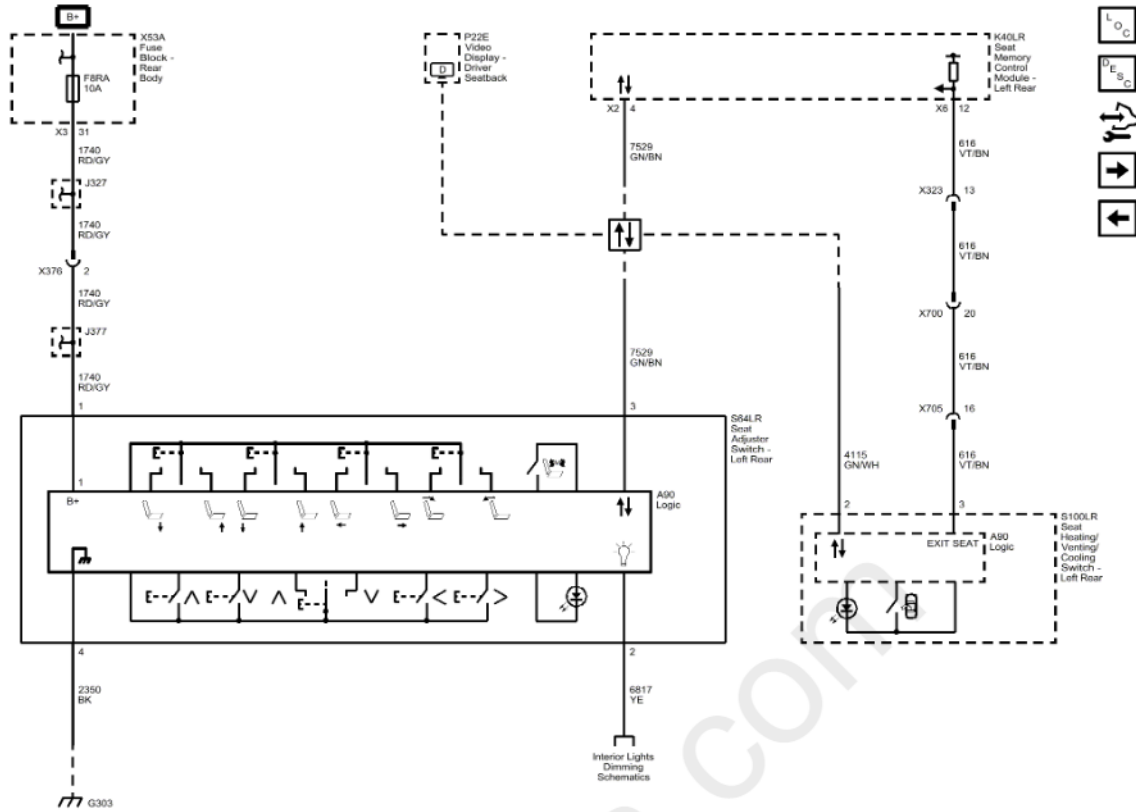
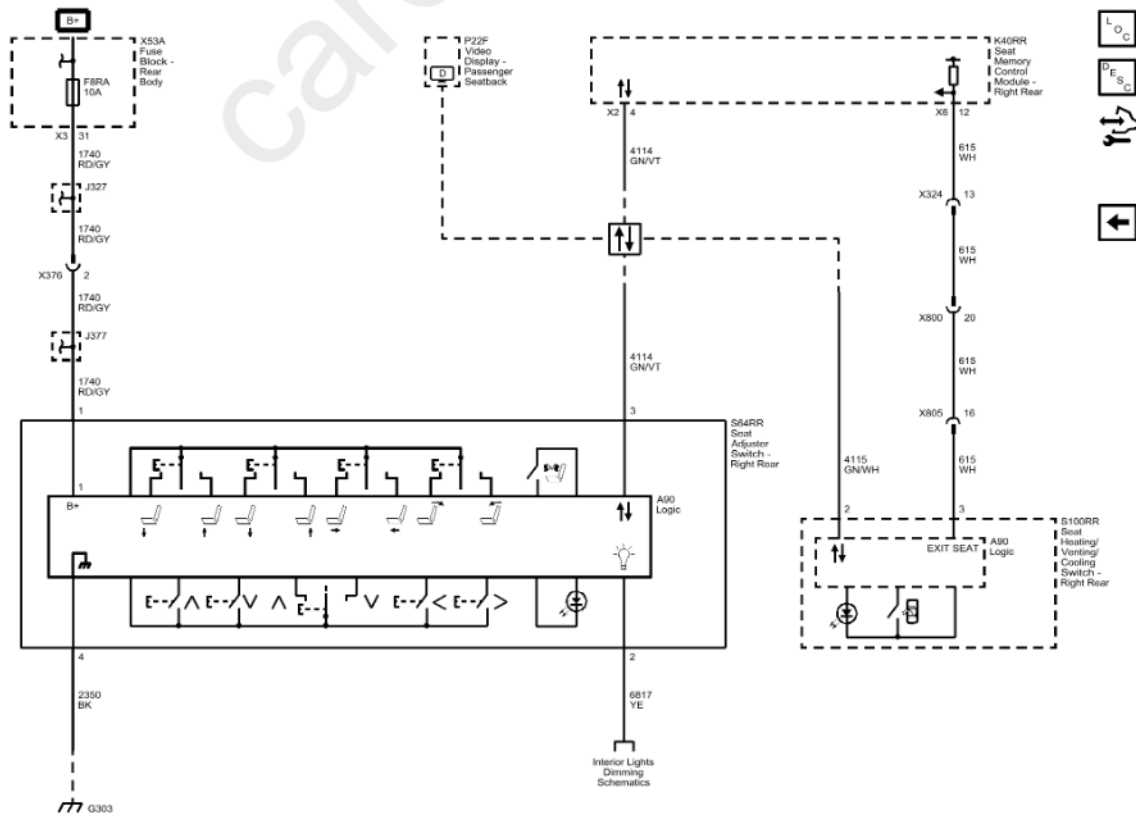


Fig. 16: Left Rear Seat Adjuster Switch and Controls
Courtesy of GENERAL MOTORS COMPANY

Right Rear Seat Adjuster Switch and Controls



DIAGNOSTIC INFORMATION AND PROCEDURES

DTC B1405, B1825, B2355, B2365, B2375 OR B3606: POSITION SENSOR CIRCUIT (FRONT SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B1405

Control Module Voltage Reference Output 2 Circuit

DTC B1825

Seat Recline Position Sensor Circuit

DTC B2355

Seat Front Vertical Position Sensor Circuit

DTC B2365

Seat Rear Vertical Position Sensor Circuit

DTC B2375

Driver Seat Assembly Horizontal Position Sensor Circuit

DTC B3606

Upper Seat Back Position Sensor Circuit

For symptom byte information, refer to [Symptom Byte List](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Sensor High Reference (2)	B1405 02, B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	-	-
Memory Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B2355 5A
Memory Seat Rear Vertical Position Sensor Signal	B2365 06	B2365 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B2365 5A

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B2375 5A
Memory Seat Recline Position Sensor Signal	B1825 06	B1825 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B1825 5A
Upper seat Back Position Sensor	B3606 06	B3606 06	B1825 06, B2355 06, B2365 06, B2375 06, B3606 06	B3606 5A

Circuit Description

The seat memory control module monitors the position of the seat motors by using hall effect position sensors which are an internal part of each motor. The module supplies each sensor with a 12 V reference circuit only when any seat motor is active and a low side signal circuit. During seat motor operation, the hall effect position sensor provides a determined number of pulse signals for every revolution of the motor shaft. The scan tool displays these pulse signals as counts that range from 0-65, 535. The module counts the feedback pulses from each sensor to determine seat position and end of travel limits for each of the seat motors. High scan tool count values indicate forward or upward seat positions while low count values indicate rearward or downward seat positions.

Conditions for Running the DTC

- Any seat motor must be active.
- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The seat memory control module does not detect position sensor movement or pulse signals while the adjuster motor is active. The following conditions will set this DTC:

B1405 02

The seat memory control module detects a short to ground or an open on the 12 V reference circuit.

B1825 01, B2355 01, B2365 01, B2375 01 or B3606 01

The seat memory control module detects a voltage greater than 5 V on the sensor signal circuit.

B1825 06, B2355 06, B2365 06 or B2375 06 or B3606 06

The seat memory control module detects a short to ground or an open on the sensor signal circuit.

Action Taken When the DTC Sets

- With a short to ground or an open circuit, the seat memory control module disables the memory recall and easy exit/entry action commands of the motor monitored by the sensor. The motor will respond to manual position commands.
- With a short to battery voltage, the seat memory control module disables the memory recall and easy exit/entry action commands for all four seat motors. The motors will respond to manual position commands.

Conditions for Clearing the DTC

- The current DTC clears when the fault is no longer present and the power mode changes to OFF then back to Ignition/Vehicle ON or Vehicle in Service Mode.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Memory Seats Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

[Circuit/System Testing](#)

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor listed below for which the DTC set:
 - M50 Seat Front Vertical Motor
 - M55 Seat Rear Vertical Motor
 - M51 Seat Horizontal Motor
 - M56 Seat Recline Motor
 - M116 Upper Seat Back Motor
2. Ignition ON/Vehicle in Service Mode.
3. Test for greater than 10.8 V between the appropriate 12 V reference circuit terminal listed below and ground while pressing any power seat switch.
 - M50 Seat Front Vertical Motor - terminal 2
 - M55 Seat Rear Vertical Motor - terminal 4
 - M51 Seat Horizontal Motor - terminal 4
 - M56 Seat Recline Motor - terminal 2
 - M116 Upper Seat Back Motor - terminal 2
 - **If 10.8 V or less**
 1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the 12 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 12 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.

- **If greater than 10.8 V**

4. Test for 0.2-2 V between the appropriate signal circuit terminal listed below and ground.

- M50 Seat Front Vertical Motor - terminal 4
- M55 Seat Rear Vertical Motor - terminal 2
- M51 Seat Horizontal Motor - terminal 2
- M56 Seat Recline Motor - terminal 4
- M116 Upper Seat Back Motor - terminal 4

- **If less than 0.2 V**

1. Ignition/Vehicle OFF, disconnect the appropriate X5 or X6 harness connector at the K40 Seat Memory Control Module.

2. Test for infinite resistance between the signal circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K40 Seat Memory Control Module.

- **If greater than 2 V**

1. Ignition/Vehicle OFF, disconnect the X5 and X6 harness connectors at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.

2. Test for less than 1 V between each signal circuit listed below and ground.

- Front vertical sensor terminal 12 X5
- Seat horizontal sensor terminal 11 X5
- Rear vertical sensor terminal 25 X5
- Seat recline sensor terminal 26 X5
- Upper seat back sensor - terminal 4 X6
- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K40 Seat Memory Control Module.

- **If between 0.2-2 V**

5. Test or replace the seat motor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Driver or Passenger Seat Cushion Frame Replacement](#)
- [Front Seat Back Upper Shoulder Adjuster Motor Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B1405, B1825, B2355, B2365, B2375 OR B3606: POSITION SENSOR CIRCUIT (REAR SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B1405

Control Module Voltage Reference Output 2 Circuit

DTC B2355

DTC B2375

Seat Assembly Horizontal Position Sensor Circuit

DTC B3606

Upper Seat Back Position Sensor Circuit

For symptom byte information, refer to [Symptom Byte List](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Sensor High Reference (2)	B1405 02, B2355 06, B2375 06, B3606 06	B1405 02, B2355 06, B2375 06, B3606 06	-	-
Memory Seat Front Vertical Position Sensor Signal	B2355 06	B2355 06	B2355 01, B2375 01, B3606 01	B2355 5A
Memory Seat Horizontal Position Sensor Signal	B2375 06	B2375 06	B2355 01, B2375 01, B3606 01	B2375 5A
Upper Seat Back Position Sensor Signal	B3606 06	B3606 06	B2355 01, B2375 01, B3606 01	B3606 5A

Circuit Description

The seat memory control module monitors the position of the seat motors by using hall effect position sensors which are an internal part of each motor. The module supplies each sensor with a 12 V reference circuit only when any seat motor is active and a low side signal circuit. During seat motor operation, the hall effect position sensor provides a determined number of pulse signals for every revolution of the motor shaft. The scan tool displays these pulse signals as counts that range from 0-65, 535. The module counts the feedback pulses from each sensor to determine seat position and end of travel limits for each of the seat motors. High scan tool count values indicate forward or upward seat positions while low count values indicate rearward or downward seat positions.

Conditions for Running the DTC

- Any seat motor must be active.
- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

The seat memory control module does not detect position sensor movement or pulse signals while the adjuster motor is active. The following conditions will set this DTC:

B1405 02

The seat memory control module detects a short to ground or an open on the 12 V reference circuit.

B2355 01, B2375 01 or B3606 01

The seat memory control module detects a short to voltage the sensor signal circuit.

B2355 06, B2375 06 or B3606 06

The seat memory control module detects a short to ground or an open on the sensor signal circuit.

Action Taken When the DTC Sets

- With a short to ground or an open circuit, the seat memory control module disables the memory recall and easy exit/entry action commands of the motor monitored by the sensor. The motor will respond to manual position commands.
- With a short to battery voltage, the seat memory control module disables the memory recall and easy exit/entry action commands for all four seat motors. The motors will respond to manual position commands.

Conditions for Clearing the DTC

- The current DTC clears when the fault is no longer present and the power mode changes to OFF then back to Ignition/Vehicle ON or Vehicle in Service Mode.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

Rear Seat Schematics (AQ9)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (Rear Seat)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor listed below for which the DTC set:
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor
 - M116 Upper Seat Back Motor
 2. Ignition ON/Vehicle in Service Mode.
 3. Test for greater than 10.8 V between the appropriate 12 V reference circuit terminal listed below and ground while pressing any power seat switch.
 - M50 Seat Front Vertical Motor - terminal 4
 - M51 Seat Horizontal Motor - terminal 4
 - M116 Upper Seat Back Motor - terminal 2
 - **If 10.8 V or less**
1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the 12 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.

- If infinite resistance
3. Test for less than 2 Ω in the 12 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If greater than 10.8 V**
4. Test for 0.2-2 V between the appropriate signal circuit terminal listed below and ground.
 - M50 Seat Front Vertical Motor - terminal 2
 - M51 Seat Horizontal Motor - terminal 2
 - M116 Upper Seat Back Motor - terminal 4
 - **If less than 0.2 V**
1. Ignition/Vehicle OFF, disconnect the appropriate X5 or X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If greater than 2 V**
1. Ignition/Vehicle OFF, disconnect the X5 and X6 harness connectors at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between each signal circuit listed below and ground.
 - Seat front vertical sensor terminal 12 X5
 - Seat horizontal sensor terminal 11 X5
 - Upper seat back sensor terminal 4 X6
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K40 Seat Memory Control Module.
 - **If between 0.2-2 V**
5. Test or replace the seat motor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Seat Adjuster Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B1850: DRIVER SEAT LUMBAR SUPPORT HORIZONTAL POSITION SENSOR CIRCUIT

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B1850

Driver Seat Lumbar Support Horizontal Position Sensor Circuit

For symptom byte information, refer to [Symptom Byte List](#)

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V Reference	B1850 06	B1850 06	B1850 01	B1850 5A
Signal	B1850 06	B1850 06	B1850 01	B1850 5A
Low Reference	-	B1850 06	-	B1850 5A

Circuit Description

The seat lumbar horizontal position sensor is attached directly to the lumbar motor it monitors. It receives a 5-V reference and a low reference from the seat memory control module. The sensor sends a voltage signal that varies with the movement of the seat through the signal circuit to the control module. Then based on this voltage signal, the control module determines the position of the seat.

Conditions for Running the DTC

The seat memory control module must be powered.

Conditions for Setting the DTC

B1850 01

If the seat memory control module sees the analog input from this sensor is greater than 4.75 V, the sensor will be considered out of range and the control module will set this DTC.

B1850 06

If the seat memory control module sees the analog input from this sensor is less than 0.22 V, the sensor will be considered out of range and the control module will set this DTC.

B1850 5A

This DTC will set, if the seat memory control module is controlling lumbar motor in one direction and its position sensor is tracking the motor in the opposite direction. The sensor is either mounted or wired incorrectly or the polarity of the motor control circuits are reversed.

Action Taken When the DTC Sets

The seat memory control module disables the memory lumbar recall commands of the lumbar horizontal motor. The lumbar motor will respond to manual positioning commands.

Conditions for Clearing the DTC

- The current DTC will clear and set to history, when the seat memory control module sees the analog input from the sensor as between 0.22-4.75 volts and the power mode changes to OFF then back to Ignition/Vehicle ON or Vehicle in Service Mode.
- The history DTC will clear after 50 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify the scan tool Driver Seat Lumbar Support Horizontal Position parameter is between 0.22 V and 4.75 V and changes when commanding the lumbar support forward and rearward.
 - **If not between 0.22 V and 4.75 V or does not change**
Refer to Circuit/System Testing.
 - **If between 0.22 V and 4.75 V and changes**
3. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF and all vehicle systems OFF, disconnect the harness connector at the M52D Seat Lumbar Support Horizontal Motor - Driver. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 10 Ω between the low reference circuit terminal 3 and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40D Seat Memory Control Module - Driver.
 - **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Test for 4.8-5.2 V between the 5 V reference circuit terminal 1 and ground.
 - **If less than 4.8 V**
 1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.
 2. Test for infinite resistance between the 5 V reference circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the 5 V reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40D Seat Memory Control Module - Driver.
 - **If greater than 5.2 V**
 1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the 5 V reference circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K40D Seat Memory Control Module - Driver.
 - **If between 4.8-5.2 V**
5. Verify the scan tool Driver Seat Lumbar Support Horizontal Position parameter is less than 0.22 V.

- **If 0.22 V or greater**

1. Ignition/Vehicle OFF, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver, Ignition ON/Vehicle in Service Mode.

2. Test for less than 1 V between the signal circuit terminal 2 and ground.

- If 1 V or greater, repair the short to voltage on the circuit.
- If less than 1 V, replace the K40D Seat Memory Control Module - Driver.

- **If less than 0.22 V**

6. Install a 3 A fused jumper wire between the signal circuit terminal 2 and the 5 V reference circuit terminal 1.

7. Verify the scan tool Driver Seat Lumbar Support Horizontal Position parameter is greater than 4.75 V.

- **If 4.75 V or less**

1. Ignition/Vehicle OFF, remove the 3 A fused jumper wire, disconnect the X5 harness connector at the K40D Seat Memory Control Module - Driver.

2. Test for infinite resistance between the signal circuit terminal 2 and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K40D Seat Memory Control Module - Driver.

- **If greater than 4.75 V**

8. Test or replace the M52D Seat Lumbar Support Horizontal Motor - Driver.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Driver or Passenger Seat Lumbar Support Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver replacement, programming and setup.

DTC B244A: SEAT ADJUSTER SWITCH INTERNAL MALFUNCTION

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B244A 39

Seat Adjuster Switch Internal Malfunction

Circuit/System Description

The seat memory control module detects an internal electronic fault in the seat adjuster switch. No external circuits are involved.

Conditions for Running the DTC

Ignition ON/Vehicle ON/Vehicle in Service Mode.

Conditions for Setting the DTC

An internal electronic fault in the seat adjuster switch will set this DTC.

Action Taken When the DTC Sets

All seat and lumbar/bolster functions are inoperative.

Conditions for Clearing the DTC

- The DTC clears when the diagnostic runs and passes.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

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Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45) Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

DTC B244A

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC B244A is not set.

- **If the DTC is set**

Replace the appropriate S64 Seat Adjuster Switch.

- **If the DTC is not set**

3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

Driver or Passenger Seat Adjuster Switch Replacement

DTC B2755 OR B2765: MEMORY SWITCH CIRCUIT (REAR SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B2755

Seat Memory Select Switch Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Signal	B2755 02	B2755 01	1	B2755 59
1. The rear seat easy exit function is inoperative				

Circuit/System Description

When the rear seat exit switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts indicating the rear seat easy exit request. In response to this signal, the seat memory control module commands the rear seat motors to move to the full down and rearward seat positions.

Conditions for Running the DTC

- DTC B1327 must not be present.
- Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B2755 01

If the seat memory control module detects an open or a short to voltage on the memory seat switch signal circuit this DTC will set.

B2755 02

If the seat memory control module detects a short to ground on the memory seat switch signal circuit this DTC will set.

B2755 59

The seat memory control module detects a stuck Exit switch for a given amount of time.

Actions Taken When the DTC Sets

- Current and history DTCs are set.
- The rear seat easy exit function is disabled.

Conditions for Clearing the DTCs

- The DTC automatically clears when the switch circuit setting the DTC is no longer active.
- A history DTC will clear once 50 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

[Rear Seat Schematics \(AQ9\)](#)

Connector End View Reference

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Description and Operation

Power Seats System Description and Operation (Rear Seat)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify the scan tool Left Rear Seat Easy Exit Switch parameter changes between Inactive and Active when pressing the left rear seat easy exit switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.
 - **If the parameter changes**
3. Verify the scan tool Right Rear Seat Easy Exit Switch parameter changes between Inactive and Active when pressing the right rear seat easy exit switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.
 - **If the parameter changes**
4. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate S100 Seat Heating/Venting/Cooling Switch, Ignition ON/Vehicle in Service Mode.
2. Press a power seat switch in order to wake up the K40 Seat Memory Control Module.
3. Test for 8 V or greater between the signal circuit terminal 3 and ground.
 - **If less than 8 V**
 1. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If 8 V or greater**
4. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.
5. Test for less than 1 V between the signal circuit terminal 3 and ground.
 - **If 1 V or greater**
Repair the short to voltage on the circuit.
 - **If less than 1 V**
6. Test or replace the S100 Seat Heating/Venting/Cooling Switch.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Seat Heater Switch Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B2755 OR B2765: MEMORY SWITCH CIRCUIT (FRONT SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B2755

Memory Select Switch Circuit

DTC B2765

Memory Set Switch Circuit

For symptom byte information, refer to [Symptom Byte List](#) .

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Signal (1)	B2755 02	1	B2755 01	B2755 59
Memory Seat Switch Set Signal	B2765 59	1	-	-
Low Reference	-	1	-	-
1. Memory recall is inoperative				

Circuit/System Description

Low reference is supplied to the seat memory switch from the seat memory control module. When a memory switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Conditions for Running the DTC

- DTC B1327 must not be present.
- Battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B2755 01

If the seat memory control module detects a short to voltage on the memory seat switch signal circuit this DTC will set.

B2755 02

If the seat memory control module detects a short to ground on the memory seat switch signal circuit this DTC will set.

B2755 59

The seat memory control module detects a stuck Memory 1, Memory 2 or Exit switch for a given amount of time.

B2765 59

If the memory set switch signal is active for greater than 15 s this DTC will set.

Actions Taken When the DTC Sets

- Current and history DTCs are set.
- All memory recall commands and are ignored.

Conditions for Clearing the DTCs

- The DTC automatically clears when the switch circuit setting the DTC is no longer active.
- A history DTC will clear once 50 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

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Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify the scan tool Seat Memory Control Module Memory Recall Switches parameter changes between Inactive and Memory 1 when pressing the memory 1 switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.
 - **If the parameter changes**
3. Verify the scan tool Seat Memory Control Module Memory Recall Switches parameter changes between Inactive and Memory 2 when pressing the memory 2 switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.

- **If the parameter changes**

4. Verify the scan tool Memory Recall Switches parameter changes between Inactive and Exit when pressing the EXIT switch.

- **If the parameter does not change**

Refer to Circuit/System Testing.

- **If the parameter changes**

5. Verify the scan tool Memory Recall Switches parameter changes between Inactive and Set when pressing the SET switch.

- **If the parameter does not change**

Refer to Circuit/System Testing.

- **If the parameter changes**

6. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate S47 Seat Memory Switch, Ignition ON/Vehicle in Service Mode.

2. Press a power seat switch in order to wake up the K40 Seat Memory Control Module.

3. Test for 9 V or greater between each signal circuit terminal listed below and ground:

- Memory set switch signal terminal 5
- Memory switch signal terminal 6

- **If less than 9 V**

1. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.

2. Test for infinite resistance between the signal circuit and ground.

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance

3. Test for less than 2 Ω in the signal circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K40 Seat Memory Control Module.

- **If 9 V or greater**

4. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.

5. Test for less than 1 V between each signal circuit terminal listed below and ground:

- Memory set switch signal terminal 5
- Memory switch signal terminal 6

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

6. Test or replace the S47 Seat Memory Switch.

Component Testing

Driver Seat Memory Switch

1. Ignition/Vehicle OFF, disconnect the harness connector at the S47 Seat Memory Switch.

2. Test for infinite resistance between each signal terminal listed below and the low reference terminal 1 with the switch in the open position.

- Terminal 5
- Terminal 6

- **If less than infinite resistance**

Replace the S47 Seat Memory Switch.

- **If infinite resistance**

3. Test for less than 4 Ω between the signal terminal 5 and the low reference terminal 1 while pressing the memory SET button.

- **If 4 Ω or greater**

Replace the S47 Seat Memory Switch.

- **If less than 4 Ω**

4. Test for 570-697 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.

- **If not between 570-697 Ω**

Replace the S47 Seat Memory Switch.

- **If between 570-697 Ω**

5. Test for 1803-2204 Ω between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.

- **If not between 1803-2204 Ω**

Replace the S47 Seat Memory Switch.

- **If between 1803-2204 Ω**

6. Test for 5.52k-6.74 k Ω between the signal terminal 6 and the low reference terminal 1 while pressing the Exit button.

- **If not between 5.52k-6.74 k Ω**

Replace the S47 Seat Memory Switch.

- **If between 5.52k-6.74 k Ω**

7. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Front Seat Adjuster Memory Switch Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B3920: SEAT MOTORS GROUP 1 COMMON CIRCUIT (FRONT SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B3920

Seat Motors Group 1 Common Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Forward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Rearward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Seat Rear Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Forward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Seat Recline Motor Rearward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Forward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Rearward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
1. The seat front vertical function is inoperative 2. The seat horizontal function is inoperative 3. The seat rear vertical function is inoperative 4. The seat back recline function is inoperative 5. The upper seat back function is inoperative				

Circuit/System Description

The seat memory control module controls the seat motors via a half bridge that is connected to power a rail internal to the module. The seat memory control module connects all of the motor control circuits on the power rail to a common reference point. The module monitors all seat motor control circuits for a shorted to ground or battery before enabling any seat motor.

When a power seat switch is pressed or when a memory recall is requested, each seat motor receives battery voltage and ground from the seat memory control module via the motor control circuits. All motors are reversible, so the direction the motor rotates depends on which control circuit voltage is applied and which control circuit ground is applied. When the switch is operated in the opposite direction, the module reverses the polarity and applies voltage and ground to the opposite circuits to move the seat in the opposite direction.

Conditions for Running the DTC

- Any seat motor must be active.
- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3920 00

Current out of the module does not match the current returning to the module from 1.5-5 A.

B3920 01

The voltage on any power rail 1 motor control circuit exceeds 2.78 V for 100 ms.

B3920 02

The voltage on any power rail 1 motor control circuit is below 1.47 V for 100 ms.

B3920 0B

The differential current measured through the high and low side of the power rail is within tolerance of each other, but the absolute current or an over-current has exceeded the maximum value.

Action Taken When the DTC Sets

The seat memory control module will not allow operation of any motor on the power rail for which the DTC was set.

Conditions for Clearing the DTC

- The current DTC clears when the fault is no longer present and the power mode changes to OFF then back Ignition/Vehicle ON or Vehicle in Service Mode.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

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Memory Seats Description and Operation

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- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

B3920 01 or B3920 02

1. Ignition/Vehicle OFF, disconnect the X3 and X4 harness connectors at the appropriate K40 Seat Memory Control Module.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
 - Seat front vertical motor up control terminal 3 X3
 - Seat front vertical motor down control terminal 4 X3
 - Seat rear vertical motor up control terminal 5 X3
 - Seat rear vertical motor down control terminal 6 X3
 - Seat horizontal motor forward control terminal 11 X3
 - Seat horizontal motor rearward control terminal 12 X3
 - Seat recline motor forward control terminal 1 X3

- Seat recline motor rearward control terminal 2 X3
- Upper seat back forward control terminal 1 X4
- Upper seat back rearward control terminal 2 X4
- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON/Vehicle in Service Mode.

4. Test for less than 1 V between each control circuit terminal listed below and ground:

- Seat front vertical motor up control terminal 3 X3
- Seat front vertical motor down control terminal 4 X3
- Seat rear vertical motor up control terminal 5 X3
- Seat rear vertical motor down control terminal 6 X3
- Seat horizontal motor forward control terminal 11 X3
- Seat horizontal motor rearward control terminal 12 X3
- Seat recline motor forward control terminal 1 X3
- Seat recline motor rearward control terminal 2 X3
- Upper seat back forward control terminal 1 X4
- Upper seat back rearward control terminal 2 X4
- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Replace the K40 Seat Memory Control Module.

B3920 00 or B3920 0B

1. Ignition ON/Vehicle in Service Mode.

2. Clear the current and history DTC.

3. Determine which motor set this DTC by operating the seat motors listed below one at a time in both directions. Check for the DTC to set between each motor test.

- M50 Seat Front Vertical Motor
- M55 Seat Rear Vertical Motor
- M51 Seat Horizontal Motor
- M56 Seat Back Recline Motor
- M116 Upper Seat Back Motor

4. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor for which the DTC set, Ignition ON/Vehicle in Service Mode.

5. Clear the DTC.

6. Verify that DTC B3920 00 or B3920 0B does not set while operating the appropriate seat switch in both directions.

- **If DTC B3920 00 or B3920 0B sets**

1. Ignition/Vehicle OFF, disconnect the appropriate X3 or X4 harness connector at the K40 Seat Memory Control Module.

2. Test for infinite resistance between the control circuits.

- If less than infinite resistance, repair the short between the circuits.
- If infinite resistance

3. Test for less than 2 Ω in each control circuit end to end:

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K40 Seat Memory Control Module.

- **If DTC B3920 00 or B3920 0B does not set**

7. Test or replace the seat motor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Driver or Passenger Seat Cushion Frame Replacement](#)
- [Front Seat Back Upper Shoulder Adjuster Motor Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B3920: SEAT MOTORS GROUP 1 COMMON CIRCUIT (REAR SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B3920

Seat Motors Group 1 Common Circuit

For symptom byte information, refer to [Symptom Byte List](#).

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Front Vertical Motor Down Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Front Vertical Motor Up Control	B3920 02	1	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Forward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Seat Horizontal Motor Rearward Control	B3920 02	2	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Forward Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Rearward Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
1. The seat front vertical function is inoperative 2. The seat horizontal function is inoperative 3. The upper seat back function is inoperative				

Circuit/System Description

The seat memory control module controls the seat motors via a half bridge that is connected to a power rail internal to the module. The seat memory control module connects all of the motor control circuits on the power rail to a common reference point. The module monitors all seat motor control circuits for a shorted to ground or battery before enabling any seat motor.

When a power seat switch is pressed the seat motor receives battery voltage and ground from the seat memory control module via the motor control circuits. All motors are reversible, so the direction the motor rotates depends on which control circuit voltage is applied and which control circuit ground is

applied. When the switch is operated in the opposite direction, the module reverses the polarity and applies voltage and ground to the opposite circuits to move the seat in the opposite direction.

Conditions for Running the DTC

- Any seat motor must be active.
- DTC B1325 must not be present.
- Module battery voltage must be between 9-16 V.

Conditions for Setting the DTC

B3920 00

Current out of the module does not match the current returning to the module from 1.5-5A.

B3920 01

The voltage on any power rail 1 motor control circuit exceeds 2.78 V for 100 ms.

B3920 02

The voltage on any power rail 1 motor control circuit is below 1.47 V for 100 ms.

B3920 0B

The differential current measured through the high and low side of the power rail is within tolerance of each other, but the absolute current or an over-current has exceeded the maximum value.

Action Taken When the DTC Sets

The seat memory control module will not allow operation of any motor on the power rail for which the DTC was set.

Conditions for Clearing the DTC

- The current DTC clears when the fault is no longer present and the power mode changes to OFF then back to Ignition/Vehicle ON or Vehicle in Service Mode.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

Rear Seat Schematics (AQ9)

Connector End View Reference

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Description and Operation

Power Seats System Description and Operation (Rear Seat)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information.

B3920 01 or B3920 02

1. Ignition/Vehicle OFF, disconnect the X3 and X4 harness connectors at the appropriate K40 Seat Memory Control Module.
2. Test for infinite resistance between each control circuit terminal listed below and ground:
 - Seat front vertical motor up control terminal 3 X3
 - Seat front vertical motor down control terminal 4 X3
 - Seat horizontal motor forward control terminal 11 X3
 - Seat horizontal motor rearward control terminal 12 X3
 - Upper seat back forward control terminal 1 X4
 - Upper seat back rearward control terminal 2 X4
 - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

3. Ignition ON/Vehicle in Service Mode.
4. Test for less than 1 V between each control circuit terminal listed below and ground:
 - Seat front vertical motor up control terminal 3 X3
 - Seat front vertical motor down control terminal 4 X3
 - Seat horizontal motor forward control terminal 11 X3
 - Seat horizontal motor rearward control terminal 12 X3
 - Upper seat back forward control terminal 1 X4
 - Upper seat back rearward control terminal 2 X4
 - **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

5. Replace the K40 Seat Memory Control Module.

B3920 00 or B3920 0B

1. Ignition ON/Vehicle in Service Mode.
2. Clear the current and history DTC.
3. Determine which motor set this DTC by operating the seat motors listed below one at a time in both directions. Check for the DTC to set between each motor test.
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor
 - M116 Upper Seat Back Motor
4. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor for which the DTC set, Ignition ON/Vehicle in Service Mode.
5. Clear the DTC.
6. Verify that DTC B3920 00 or B3920 0B does not set while operating the appropriate seat switch in both directions.

- **If DTC B3920 00 or B3920 0B sets**

1. Ignition/Vehicle OFF, disconnect the appropriate X3 or X4 harness connector at the K40 Seat Memory Control Module.
2. Test for infinite resistance between the control circuits.
 - If less than infinite resistance, repair the short between the circuits.
 - If infinite resistance
3. Test for less than 2 Ω in each control circuit end to end:

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the K40 Seat Memory Control Module.

- **If DTC B3920 00 or B3920 0B does not set**

7. Test or replace the seat motor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Seat Adjuster Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

DTC B392B: SEAT LUMBAR/BOLSTER PUMP

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

DTC Descriptors

DTC B392B 00

Seat Lumbar/Bolster Pump

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1520 00,	U1520 00	-	-
Local Interconnect Network Serial Data Bus 13	U1502 00, U1520 00, U1528 00	U1520 00	U1502 00, U1520 00, U1528 00	-
Seat Bolster Memory Control Module Ground	-	U1520 00	-	-
Seat Lumbar/Bolster Pump Control	B392B 00	B392B 00	B392B 00	-
Seat Lumbar/Bolster Pump Ground	-	B392B 00	-	-

Circuit/System Description

When a seat lumbar/bolster or massage function is commanded ON, the seat bolster memory control module applies battery voltage to the seat lumbar/bolster pump. The pump runs to inflate the lumbar/bolster bladders until the switch is released.

Conditions for Running the DTC

- Ignition ON/Vehicle/Vehicle in Service Mode.
- The voltage control circuit to the lumbar/bolster pump must be active.

Conditions for Setting the DTC

The seat bolster memory control module detects an open, a short to ground or a short to voltage on the lumbar/bolster pump voltage control circuit. The DTC will set as a current DTC for approximately 25s then turn to history.

Action Taken When the DTC Sets

All lumbar and massage functions are inoperative.

Conditions for Clearing the DTC

- The DTC clears when the diagnostic runs and passes.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

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Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45) Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Testing

1. Ignition/Vehicle OFF and all vehicle systems OFF, disconnect the harness connector at the appropriate G31 Seat Lumbar/Bolster Pump.
2. Test for less than 10 Ω between the low reference circuit terminal 2 and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF, disconnect the harness connector at the K134 Seat Bolster Memory Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K134 Seat Bolster Memory Control Module.
 - **If less than 10 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Test for less than 1 V between the control circuit terminal 1 and ground.
 - **If 1 V or greater**
 1. Ignition/Vehicle OFF, disconnect the harness connector at the K134 Seat Bolster Memory Control Module, Ignition ON/Vehicle in Service Mode.
 2. Test for less than 1 V between the control circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K134 Seat Bolster Memory Control Module.
 - **If less than 1 V**
5. Ignition/Vehicle OFF, disconnect the harness connector at the K134 Seat Bolster Memory Control Module.

6. Test for infinite resistance between the control circuit terminal 1 and ground.

- **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

7. Test for less than 2 Ω in the control circuit end to end.

- **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

- **If less than 2 Ω**

8. Perform the seat lumbar/bolster pump component test below.

- **If the seat lumbar/bolster pump passed the component test**

9. Replace the K134 Seat Bolster Memory Control Module.

Component Testing

Seat Lumbar/Bolster Pump

1. Ignition/Vehicle OFF, disconnect the harness connector at the G31 Seat Lumbar/Bolster Pump.

2. Install a 10 A fused jumper wire between control terminal 1 and 12 V.

3. Momentarily install a jumper wire between the ground terminal 2 and ground. The seat lumbar/Bolster pump should momentarily turn ON.

- **If the pump does not turn ON**

Replace the G31 Seat Lumbar/Bolster Pump.

- **If the pump turns ON**

4. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Front Seat Lumbar Support Bladder Pump Replacement**
- **Control Module References** for K134D Seat Bolster Memory Control Module - Driver and K134P Seat Bolster Memory Control Module - Passenger replacement, programming and setup

DTC B392C: SEAT BOLSTER MEMORY CONTROL MODULE INTERNAL MALFUNCTION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B392C 39

Seat Bolster Memory Control Module Internal Malfunction

Circuit/System Description

The seat memory control module detects an internal electronic fault in the seat bolster memory control module. No external circuits are involved.

Conditions for Running the DTC

Ignition ON/Vehicle ON/Vehicle in Service Mode.

Conditions for Setting the DTC

The control module detects an internal fault.

An internal electronic fault in the seat bolster memory control module will set this DTC.

Action Taken When the DTC Sets

All lumbar/bolster functions will be inoperative.

Conditions for Clearing the DTC

- The DTC clears when the diagnostic runs and passes.
- The history DTC will clear after 40 consecutive fault-free Ignition/Vehicle ON/OFF switch cycles have occurred.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45)Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information.

Circuit/System Verification

DTC B392C

1. Ignition ON/Vehicle in Service Mode.
2. Verify DTC B392C is not set.

- **If the DTC is set**

Replace the appropriate K134 Seat Bolster Memory Control Module.

- **If the DTC is not set**

3. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

[Control Module References](#) for K134D Seat Bolster Memory Control Module - Driver or K134P Seat Bolster Memory Control Module - Passenger replacement, programming and setup

NOTE: The following steps must be completed before using the symptom tables.

1. Perform the [Diagnostic System Check - Vehicle](#) before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following system descriptions:
 - [Lumbar Support Description and Operation \(2-Way with Memory A45\)](#)[Lumbar Support Description and Operation \(With Seat Bolster Memory Control Module\)](#)
 - [Memory Seats Description and Operation](#)
 - [Power Seats System Description and Operation \(Rear Seat\)](#)

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the system. Refer to [Checking Aftermarket Accessories](#).
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#).

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- [Lumbar Support Malfunction \(With Seat Bolster Memory Control Module AQ9\)](#)[Lumbar Support Malfunction \(2-Way Lumbar AL2\)](#)
- [Memory Seat Feature Malfunction](#)
- [Power Seat Malfunction \(Front Seat\)](#)[Power Seat Malfunction \(Rear Seat\)](#)
- [Rear Seat Easy Exit Feature Malfunction](#)

LUMBAR SUPPORT MALFUNCTION (WITH SEAT BOLSTER MEMORY CONTROL MODULE AQ9)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
B+	U1520 00	U1520 00	-	-
Linear Interconnect Network Bus 13	U1502 00, U1520 00, U1528 00	U1520 00	U1502 00, U1520 00, U1528 00	-
Seat Bolster Memory Control Module Ground	-	U1520 00	-	-
Seat Lumbar/Bolster Pump Control	B392B 00	B392B 00	B392B 00	-

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Lumbar/Bolster Pump Ground	-	B392B 00	-	-

Circuit/System Description

The seat adjuster switch on vehicles equipped with the seat memory lumbar/bolster feature is a LIN Bus device. When a seat function select switch, lumbar/bolster 4-way switch or the massage switch is pressed, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the seat lumbar/bolster request. The seat memory control module then commands the seat bolster memory module, via LIN serial data messages, to perform the required pneumatic movements.

The seat bolster memory control module contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures. When a seat lumbar or massage function is commanded ON, the module applies battery voltage to the external seat air pump motor when any of the air bladders require inflating.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)
- [Rear Seat Schematics \(AQ9\)](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Lumbar Support Description and Operation (2-Way with Memory A45) Lumbar Support Description and Operation (With Seat Bolster Memory Control Module)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify that no DTCs are set.

- **If any DTC is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **If no DTCs are set**

3. Select the appropriate scan tool control module listed below:
 - Seat Memory Control Module - Driver
 - Seat Memory Control Module - Passenger
 - Seat Memory Control Module - Left Rear
 - Seat Memory Control Module - Right Rear
4. Verify the scan tool Seat Function Select Switch parameter changes between Inactive and UP or Down when operating the switch.
 - **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

5. Verify the scan tool Seat 4-Way Switch parameter changes between Inactive and UP/Down or Forward/Rearward when operating the 4-way switch in the up/down and forward/rearward directions.

- **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

6. Verify the scan tool Seat Massage Switch parameter changes between Active and Inactive when pressing the seat massage switch.

- **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

7. Verify that all K134 Seat Bolster Memory Control Module functions operate when being controlled by the S64 Seat Adjuster Switch.

- **If all K134 Seat Bolster Memory Control Module functions are inoperative**

Perform the seat lumbar/bolster pump component test below.

- **If any but not all of the K134 Seat Bolster Memory Control Module functions is inoperative**

1. Ignition ON/Vehicle in Service Mode.
2. Test the integrity of the air hoses and bladders for the inoperative lumbar/bolster function.
 - If a fault is found with the air hoses or bladders, repair or replace as needed.
 - If the air hoses and bladders test normal.

3. Replace the K134 Seat Bolster Memory Control Module.

- **If all K134 Seat Bolster Memory Control Module functions operate**

8. All OK.

Component Testing

Seat Lumbar/Bolster Pump

1. Ignition OFF, disconnect the harness connector at the G31 Seat Lumbar/Bolster Pump.
2. Install a 10 A fused jumper wire between control terminal 1 and 12 V.
3. Momentarily install a jumper wire between the ground terminal 2 and ground. The seat lumbar/Bolster pump should momentarily turn ON.

- **If the pump does not turn ON**

Replace the G31 Seat Lumbar/Bolster Pump.

- **If the pump turns ON**

4. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Front Seat Lumbar Support Bladder Pump Replacement**
- **Front Seat Back Lumbar Bladder Replacement**
- **Rear Seat Lumbar Support Replacement**
- **Rear Seat Lumbar Support Bladder Pump Replacement**

- [Control Module References](#) for K134 Seat Bolster Memory Control Module replacement, programming and setup.

LUMBAR SUPPORT MALFUNCTION (2-WAY LUMBAR AL2)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Power Seat Lumbar Motor Forward Control	B3920 02	1	B3920 01	-
Power Seat Lumbar Motor Rearward Control	B3920 02	1	B3920 01	-
1. The seat lumbar support is inoperative				

Circuit/System Description

The seat lumbar horizontal motor is reversible. When the seat lumbar switch is operated to move the lumbar support forward, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the lumbar support forward command. In response to this signal, the seat memory control module applies battery voltage through the seat lumbar motor forward control circuit and ground through the seat lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward towards the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

[Lumbar Support Description and Operation \(2-Way with Memory A45\)](#)[Lumbar Support Description and Operation \(With Seat Bolster Memory Control Module\)](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode
2. Verify that all power seat functions operate when being controlled by the S64 Seat Adjuster Switch.
 - **If any power seat function does not operate**
Refer to **Power Seat Malfunction (Front Seat)** and/or **Power Seat Malfunction (Rear Seat)**.
 - **If all power seat functions operate**
3. Verify the appropriate scan tool lumbar switch parameter listed below changes between Inactive and Forward/Rearward when pressing the lumbar switch in both directions.
 - Driver Lumbar Support Horizontal Switch
 - Passenger Lumbar Support Horizontal Switch
 - **If the parameter does not change**
Test or replace the S64 Seat Adjuster Switch.
 - **If the parameter changes**
4. Refer to Circuit/System Testing.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate M52 Seat Lumbar Support Horizontal Motor.
2. Connect a test lamp between control circuit terminal A and control circuit terminal B, Ignition ON/Vehicle in Service Mode.
3. Verify the test lamp turns ON when commanding the Seat Lumbar Support Horizontal Movement Forward and Rearward states with a scan tool.

NOTE: Once the lumbar motor is commanded On using the scan tool, the lumbar function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.

- **If the test lamp remains OFF during either of the commands**
 1. Ignition/Vehicle OFF, disconnect the X3 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If the test lamp turns ON during each of the commands**
4. Test or replace the M52 Seat Lumbar Support Horizontal Motor.

Component Testing

Lumbar Horizontal Motor

1. Ignition/Vehicle OFF, disconnect the harness connector at the M52 Seat Lumbar Support Horizontal Motor.
2. Install a 30 A fused jumper wire between control terminal A and 12 V.

NOTE: When performing the following tests, make sure that the lumbar support is not already in the position the test is attempting to produce.

3. Momentarily install a jumper wire between control terminal B and ground. The lumbar motor should momentarily perform the appropriate FORWARD/ REARWARD function.

- **If the motor does not perform the FORWARD/ REARWARD function**

Replace the M52 Seat Lumbar Support Horizontal Motor.

- **If the motor performs the FORWARD/ REARWARD function**

4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD function.

- **If the motor does not perform the FORWARD/ REARWARD function**

Replace the M52 Seat Lumbar Support Horizontal Motor.

- **If the motor performs the FORWARD/ REARWARD function**

5. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Driver or Passenger Seat Adjuster Switch Replacement](#)
- [Driver or Passenger Seat Lumbar Support Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

MEMORY SEAT FEATURE MALFUNCTION

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Signal (1)	B2755 02	1	B2755 01	B2755 59
Memory Seat Switch Set Signal	B2765 59	1	-	-
Low Reference	-	1	-	-
1. Memory seat feature is inoperative				

Circuit/System Description

Low reference is supplied to the seat memory switch from the seat memory control module. When a memory switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Diagnostic Aids

The seat memory control module must be awake when measuring voltage from either one of the memory seat switch signal circuits. Voltage readings of 0.0 V or 5.0 V are possible if the module is not fully awake and result in misdiagnosing the circuit.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)

- [Passenger Seat Schematics](#)

Connector End View Reference

[COMPONENT CONNECTOR END VIEWS - INDEX](#)

Description and Operation

[Memory Seats Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information.

[Circuit/System Verification](#)

1. Ignition ON/Vehicle in Service Mode.
2. Verify that all manual power seat functions operate when being controlled by the power seat adjuster switches.

- **If any manual power seat function does not operate**

Refer to [Power Seat Malfunction \(Front Seat\)](#) and/or [Power Seat Malfunction \(Rear Seat\)](#)

- **If all manual power seat functions operate**

3. Refer to Circuit/System Testing.

[Circuit/System Testing](#)

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate S47 Seat Memory Switch. It may take up to 2 min for all vehicle systems to power down.
2. Test for less than 30 Ω between the low reference circuit terminal 1 and ground.
 - **If 30 Ω or greater**
 1. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for less than 2 Ω in the low reference circuit end to end
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If less than 30 Ω**
3. Ignition ON/Vehicle in Service Mode.
4. Press a power seat switch in order to wake up the K40 Seat Memory Control Module.
5. Test for 9 V or greater between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If less than 9 V**
 1. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance

3. Test for less than $2\ \Omega$ in the signal circuit end to end.
 - If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - If less than $2\ \Omega$, replace the K40 Seat Memory Control Module.
 - **If $9\ \text{V}$ or greater**
6. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.
7. Test for less than $1\ \text{V}$ between each signal circuit terminal listed below and ground:
 - Memory set switch signal terminal 5
 - Memory switch signal terminal 6
 - **If $1\ \text{V}$ or greater**

Repair the short to voltage on the circuit.

 - **If less than $1\ \text{V}$**
8. Test or replace the S47 Seat Memory Switch.

Component Testing

Seat Memory Switch

1. Ignition/Vehicle OFF, disconnect the harness connector at the S47 Seat Memory Switch.
2. Test for infinite resistance between each signal terminal listed below and the low reference terminal 1 with the switch in the open position.
 - Terminal 5
 - Terminal 6
 - **If less than infinite resistance**

Replace the S47 Seat Memory Switch.

 - **If infinite resistance**
3. Test for less than $4\ \Omega$ between the signal terminal 5 and the low reference terminal 1 while pressing the memory SET button.
 - **If $4\ \Omega$ or greater**

Replace the S47 Seat Memory Switch.

 - **If less than $4\ \Omega$**
4. Test for $573\text{--}701\ \Omega$ between the signal terminal 6 and the low reference terminal 1 while pressing the memory 1 button.
 - **If not between $573\text{--}701\ \Omega$**

Replace the S47 Seat Memory Switch.

 - **If between $573\text{--}701\ \Omega$**
5. Test for $1800\text{--}2201\ \Omega$ between the signal terminal 6 and the low reference terminal 1 while pressing the memory 2 button.
 - **If not between $1800\text{--}2201\ \Omega$**

Replace the S47 Seat Memory Switch.

 - **If between $1800\text{--}2201\ \Omega$**
6. Test for $5.52\text{k} - 6.73\ \text{k}\Omega$ between the signal terminal 6 and the low reference terminal 1 while pressing the Exit button.
 - **If not between $5.52\text{k} - 6.73\ \text{k}\Omega$**

Replace the S47 Seat Memory Switch.

 - **If between $5.52\text{k} - 6.73\ \text{k}\Omega$**

7. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Front Seat Adjuster Memory Switch Replacement](#)
- [Control Module References](#) for K40D Seat Memory Control Module - Driver or K40P Seat Memory Control Module - Passenger replacement, programming and setup.

POWER SEAT MALFUNCTION (FRONT SEAT)

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 1 X1	1, 2	1, 2	-	-
Seat Memory Control Module B+ Terminal 2 X1	1	1	-	-
Linear Interconnect Network Bus 13	U1502 00, U1520 00, U1528 00	U1520 00	U1502 00, U1520 00, U1528 00	-
Power Seat Front Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Power Seat Front Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Forward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Rearward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Power Seat Rear Vertical Motor Down Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Power Seat Rear Vertical Motor Up Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Power Seat Recline Motor Forward Control	B3920 02	6	B3920 01	B3920 00, B3920 0B
Power Seat Recline Motor Rearward Control	B3920 02	6	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Forward Control	B3920 02	7	B3920 01	B3920 00, B3920 0B

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Upper Seat Back Motor Rearward Control	B3920 02	7	B3920 01	B3920 00, B3920 0B
Ground	-	1, 2	-	-
1. All power seat and memory functions are inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. The seat front vertical motor is inoperative 4. The seat horizontal motor is inoperative 5. The seat rear vertical motor is inoperative 6. The seat back recline motor is inoperative 7. The upper seat back motor is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a 10 A fuse located in the rear body fuse block. This voltage is used by the module for logic power. Battery positive voltage is also supplied at all times to the seat memory control module through a 30 A fuse also located in the rear body fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors. Each seat motor is controlled by the seat memory control module by applying power and ground through the control circuits to the motor.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the entire seat forward command. In response to this message, the seat memory control module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

- [Driver Seat Schematics](#)
- [Passenger Seat Schematics](#)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Memory Seats Description and Operation

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify that no DTCs are set.

- **If any DTC is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .

- **If no DTCs are set**

3. Verify the scan tool Seat Function Select Switch parameter changes between Inactive and UP or Down when operating the switch.

- **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

4. Verify the scan tool Seat 4-Way Switch parameter changes between Inactive and Forward/Rearward or Up/Down when pressing the switch in the appropriate direction.

- **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

5. Verify the scan tool seat switch parameters listed below change between Inactive and Forward/Rearward or Up/Down when pressing the appropriate switch.

- Seat Horizontal Switch
- Seat Cushion Front Vertical Switch
- Seat Cushion Rear Vertical Switch
- Seat Back Switch
- **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.

- **If the parameter changes**

6. Verify that all seat directional motors listed below operate while operating the appropriate seat switch in both directions.

- M50 Seat Front Vertical Motor
- M55 Seat Rear Vertical Motor
- M51 Seat Horizontal Motor
- M56 Seat Recline Motor
- M116 Upper Seat Back Motor
- **If any seat motor does not operate**

Refer to Circuit/System Testing.

- **If all seat motors operate**

7. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the X2 harness connector at the appropriate control module listed below. It may take up to 2 min for all vehicle systems to power down.

- K40D Seat Memory Control Module - Driver
- K40P Seat Memory Control Module - Passenger

2. Test for less than 10 Ω between ground circuit terminal 5 and ground.

- **If 10 Ω or greater**

1. Ignition/Vehicle OFF.

2. Test for less than 2 Ω in the ground circuit end to end.

- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , repair the open/high resistance in the ground connection.

- **If less than 10 Ω**
3. Ignition/Vehicle OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.
 4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is OK.**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open.**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40 Ω Seat Memory Control Module.
 - **If the test lamp illuminates.**
 5. Ignition/Vehicle OFF, connect the X1 and X2 harness connectors at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
 - M50 Seat Front Vertical Motor
 - M55 Seat Rear Vertical Motor
 - M51 Seat Horizontal Motor
 - M56 Seat Recline Motor
 - M116 Upper Seat Back Motor
 6. Connect a test lamp between the appropriate control circuit terminals listed below, Ignition ON/Vehicle in Service Mode.
 - M50 Seat Front Vertical Motor - Terminal 1 and Terminal 3
 - M55 Seat Rear Vertical Motor - Terminal 1 and Terminal 5
 - M51 Seat Horizontal Motor - Terminal 1 and Terminal 5
 - M56 Seat Recline Motor - Terminal 1 and Terminal 3
 - M116 Upper Seat Back Motor - Terminal 1 and Terminal 3
 7. Verify the test lamp turns ON when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.

NOTE: Once a seat motor is commanded On using the scan tool, the seat function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.

- **If the test lamp remains OFF during either of the commands**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the appropriate X3 or X4 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If the test lamp turns ON during each of the commands**
8. Test or replace the seat motor.

Component Testing

Seat Motor

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor listed below:

- M50 Seat Front Vertical Motor
- M55 Seat Rear Vertical Motor
- M51 Seat Horizontal Motor
- M56 Seat Recline Motor
- M116 Upper Seat Back Motor

2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.

NOTE: When performing the following tests, make sure that the seat is not already in the position the test is attempting to produce.

3. Momentarily install a jumper wire between control terminal 3 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.

- **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

Replace the seat motor.

- **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**

4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.

- **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**

Replace the seat motor.

- **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**

5. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Driver or Passenger Seat Adjuster Switch Replacement**
- **Driver or Passenger Seat Cushion Frame Replacement**
- **Front Seat Back Upper Shoulder Adjuster Motor Replacement**
- **Control Module References** for K40 Seat Memory Control Module replacement, programming and setup

POWER SEAT MALFUNCTION (REAR SEAT)

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Seat Memory Control Module B+ Terminal 1 X1	U1555 00, U155D 00	1, 2	-	-
Seat Memory Control Module B+ Terminal 2 X1	1	1	-	-
Local Interconnect Network Serial Data Bus 7	U1502 00, U1520 00, U1528 00	U1520 00, U1528 00	U1502 00, U1520 00, U1528 00	-
Power Seat Front Vertical Motor Down Control	B3920 02	3	B3920 01	B3920 00, B3920 0B

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Power Seat Front Vertical Motor Up Control	B3920 02	3	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Forward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Power Seat Horizontal Motor Rearward Control	B3920 02	4	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Forward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Upper Seat Back Motor Rearward Control	B3920 02	5	B3920 01	B3920 00, B3920 0B
Ground	-	1, 2	-	-
1. Power seat and memory functions are inoperative 2. Scan Tool Does Not Communicate with Low Speed GMLAN Device 3. The seat front vertical function is inoperative 4. The seat horizontal function is inoperative 5. The upper seat back function is inoperative				

Circuit/System Description

Battery voltage is supplied at all times to the seat memory control module through a 10 A fuse located in the rear body fuse block. This voltage is used by the module for logic power. Battery positive voltage is also supplied at all times to the seat memory control module through a 30 A fuse also located in the rear body fuse block. This voltage is connected to a power rail internal to the seat memory control module and is used to drive the power seat motors. Each seat motor is controlled by the seat memory control module by applying power and ground through the control circuits to the motor.

All motors are reversible. For example, when the seat switch is operated to move the entire seat forward, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the entire seat forward command. In response to this message, the seat memory control module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery positive voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction.

Reference Information

Schematic Reference

Rear Seat Schematics (AQ9)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (Rear Seat)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information.

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify that no DTCs are set.
 - **If any DTC is set**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) .
 - **If no DTCs are set**
3. Verify the appropriate Seat Memory Control Module - Left Rear or Right Rear, scan tool Seat Function Select Switch parameter changes between Inactive and UP or Down when operating the switch.
 - **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch - Rear.
 - **If the parameter changes**
4. Verify the scan tool Seat 4-Way Switch parameter changes between Inactive and Forward/Rearward or Up/Down when pressing the switch in the appropriate direction.
 - **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch - Rear.
 - **If the parameter changes**
5. Verify the scan tool Seat Massage Switch parameter changes between Inactive and Active when pressing the massage switch.
 - **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch - Rear.
 - **If the parameter changes**
6. Verify the scan tool seat switch parameters listed below change between Inactive and Forward/Rearward or Up/Down when pressing the appropriate switch.
 - Rear Seat Horizontal Switch
 - Rear Seat Cushion Front Vertical Switch
 - **If the parameter does not change**

Test or replace the S64 Seat Adjuster Switch.
 - **If the parameter changes**
7. Verify the seat directional motors listed below operate while operating the appropriate seat switch in both directions.
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor
 - M116 Upper Seat Back Motor
 - **If any seat motor does not operate**

Refer to Circuit/System Testing.
 - **If all seat motors operate**
8. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the X2 harness connector at the appropriate control module listed below. It may take up to 2 min for all vehicle systems to power down.
 - K40LR Seat Memory Control Module - Left Rear
 - K40RR Seat Memory Control Module - Right Rear

2. Test for less than 10 Ω between ground circuit terminal 5 and ground.
 - **If 10 Ω or greater**
 1. Ignition/Vehicle OFF.
 2. Test for less than 2 Ω in the ground circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , repair the open/high resistance in the ground connection.
 - **If less than 10 Ω**
3. Ignition/Vehicle OFF, disconnect the X1 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.
4. Verify a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is OK.**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for less than 2 Ω in the B+ circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , verify the fuse is OK and there is voltage at the fuse.
 - **If the test lamp does not illuminate and the circuit fuse is open.**
 1. Ignition/Vehicle OFF, remove the test lamp.
 2. Test for infinite resistance between the B+ circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K40 Seat Memory Control Module.
 - **If the test lamp illuminates.**
5. Ignition/Vehicle OFF, connect the X1 and X2 harness connectors at the K40 Seat Memory Control Module and disconnect the harness connector at the appropriate seat motor listed below:
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor
 - M116 Upper Seat Back Motor
6. Connect a test lamp between appropriate control circuit terminals listed below, Ignition ON/Vehicle in Service Mode.
 - M50 Seat Front Vertical Motor terminal 1 and terminal 5
 - M51 Seat Horizontal Motor terminal 1 and terminal 5
 - M116 Upper Seat Back Motor terminal 1 and terminal 3
7. Verify the test lamp turns ON when commanding the seat motor in the Up/Down or Forward/Rearward states with a scan tool.

NOTE: Once a seat motor is commanded On using the scan tool, the seat function may not work using the seat adjuster switch until you back out of the scan tool Control Functions menu.

- **If the test lamp remains OFF during either of the commands**
 1. Ignition/Vehicle OFF, remove the test lamp, disconnect the appropriate X3 or X4 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between each control circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in each control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If the test lamp turns ON during each of the commands**
8. Test or replace the seat motor.

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate seat motor listed below:
 - M50 Seat Front Vertical Motor
 - M51 Seat Horizontal Motor
 - M116 Upper Seat Back Motor
2. Install a 30 A fused jumper wire between control terminal 1 and 12 V.

NOTE: When performing the following tests, make sure that the seat is not already in the position the test is attempting to produce.

3. Momentarily install a jumper wire between control terminal 5 and ground. The seat motor should momentarily perform the appropriate FORWARD/ REARWARD/ UP/ DOWN function.
 - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**
Replace the seat motor.
 - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
4. Reverse the jumper wires; the motor should perform FORWARD/ REARWARD/ UP/ DOWN function.
 - **If the motor does not perform the FORWARD/ REARWARD/ UP/ DOWN function**
Replace the seat motor.
 - **If the motor performs the FORWARD/ REARWARD/ UP/ DOWN function**
5. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Seat Adjuster Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

REAR SEAT EASY EXIT FEATURE MALFUNCTION

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Memory Seat Switch Signal (1)	B2755 02	B2755 01	1	B2755 59
1. The rear seat easy exit function is inoperative				

Circuit/System Description

When the rear seat exit switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts indicating the rear seat easy exit request. In response to this signal, the seat memory control module commands the rear seat motors to move to the full down and rearward seat positions.

Reference Information

Schematic Reference

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Description and Operation

Power Seats System Description and Operation (Rear Seat)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON/Vehicle in Service Mode.
2. Verify the scan tool Left Rear Seat Easy Exit Switch parameter changes between Inactive and Active when pressing the left rear seat easy exit switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.
 - **If the parameter changes**
3. Verify the scan tool Right Rear Seat Easy Exit Switch parameter changes between Inactive and Active when pressing the right rear seat easy exit switch.
 - **If the parameter does not change**
Refer to Circuit/System Testing.
 - **If the parameter changes**
4. All OK.

Circuit/System Testing

1. Ignition/Vehicle OFF, disconnect the harness connector at the appropriate S100 Seat Heating/Venting/Cooling Switch, Ignition ON/Vehicle in Service Mode.
2. Press a power seat switch in order to wake up the K40 Seat Memory Control Module.
3. Test for 8 V or greater between the signal circuit terminal 3 and ground.
 - **If less than 8 V**
 1. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module.
 2. Test for infinite resistance between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance
 3. Test for less than 2 Ω in the signal circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω , replace the K40 Seat Memory Control Module.
 - **If 8 V or greater**
4. Ignition/Vehicle OFF, disconnect the X6 harness connector at the K40 Seat Memory Control Module, Ignition ON/Vehicle in Service Mode.

5. Test for less than 1 V between the signal circuit terminal 3 and ground.

- **If 1 V or greater**

Repair the short to voltage on the circuit.

- **If less than 1 V**

6. Test or replace the S100 Seat Heating/Venting/Cooling Switch.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Rear Seat Heater Switch Replacement](#)
- [Control Module References](#) for K40 Seat Memory Control Module replacement, programming and setup.

REPAIR INSTRUCTIONS

WIRE TO WIRE REPAIR - SEATS

Special Tools

- **EL-38125-10** Splice Sleeve Crimping Tool (non GMNA)
- **J-38125-5A** Ultra Torch Special Tool
- **J-38125-8** Splice Sleeve Crimping Tool (GMNA)

For equivalent regional tools, refer to [Special Tools](#).

WARNING: In order to reduce the risk of personal injury, loss of high voltage isolation to ground and higher system impedance, do not attempt to repair any HV wiring, connector or terminal that is damaged. High voltage coaxial type cables are not repairable. Never attempt to repair a coaxial type cable. The entire cable/harness or component must be replaced. In order to maintain system integrity and personal safety, never attempt to repair any high voltage wiring, cables or terminals. Performing this procedure on high voltage circuits may result in serious injury or death.

NOTE: If the wiring harness internal to the transmission is damaged, the wiring harness must be replaced. The use of splice sleeves in an attempt to repair the internal transmission wires, connectors or terminals could result in performance issues.

NOTE: Do not splice wires in Door Harness Grommets.

NOTE: The DuraSeal splice sleeves have the following 2 critical features:

- A special heat shrink sleeve environmentally seals the splice. The heat shrink sleeve contains a sealing adhesive inside.
- A cross hatched (knurled) core crimp provides the necessary low resistance contact integrity for these sensitive, low energy circuits.

Use only DuraSeal splice sleeves to form a one-to-one splice on all types of insulation except high voltage and specialty cables. Use DuraSeal splice sleeves where there are special requirements such as moisture sealing. Follow the instructions below in order to splice copper wire using DuraSeal splice sleeves.

Splice Sleeve Selection

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm ² / (AWG)
	3 Crimp Nests	4 Crimp Nests	

Splice Sleeve Color	Crimp Tool Nest Color		Wire Gauge mm ² / (AWG)
	3 Crimp Nests	4 Crimp Nests	
Salmon (Yellow-Pink) 19300089	Red (1) or Red/Green (1)	Red (2)	0.22-0.8/(18-26)
Blue 19168447	Blue (2)	Blue (3)	1.0-2.0/(14-16)
Yellow 19168448	Yellow (3)	Yellow (4)	3.0-5.0/(10-12)

1. Open the harness by removing any tape:

NOTE: You must perform the following procedures in the listed order. Repeat the procedure if any wire strands are damaged. You must obtain a clean strip with all of the wire strands intact.

- Use a sewing seam ripper, available from sewing supply stores, in order to cut open the harness in order to avoid wire insulation damage.
 - Use the DuraSeal splice sleeves on all types of insulation except Tefzel and coaxial.
 - Do not use the crimp and DuraSeal splice sleeve to form a splice with more than 2 wires coming together.
2. Cut as little wire off the harness as possible. You may need the extra length of wire in order to change the location of a splice.

Adjust splice locations so that each splice is at least 40 mm (1.5 in) away from the other splices, harness branches or connectors.
 3. Strip the insulation:
 - When adding a length of wire to the existing harness, use the same size wire as the original wire.
 - Perform one of the following items in order to find the correct wire size:
 - Find the wire on the schematic and convert to regional wiring gauge size.
 - If you are unsure of the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation.
 - Strip approximately 5.0 mm (0.20 in) of insulation from each wire to be spliced.
 - Do not nick or cut any of the strands. Inspect the stripped wire for nicks or cut strands.
 - If the wire is damaged, repeat this procedure after removing the damaged section.
 4. For high temperature wiring, slide a section of high temperature SCT1 shrink tubing down the length of wire to be spliced. Ensure that the shrink tubing will not interfere with the splice procedure.
 5. Select the proper DuraSeal splice sleeve according to the wire size. Refer to the above table at the beginning of the repair procedure for the color coding of the DuraSeal splice sleeves and the crimp tool nests.
 6. The **EL-38125-10** splice sleeve crimping tool has four crimp nests. The largest crimp nest (4) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (3) is used for crimping 14 and 16 gauge wires. The third largest crimp nest (2) is used for crimping 18 and 20 gauge wires. The smallest crimp nest (1) is used for crimping 22 to 26 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

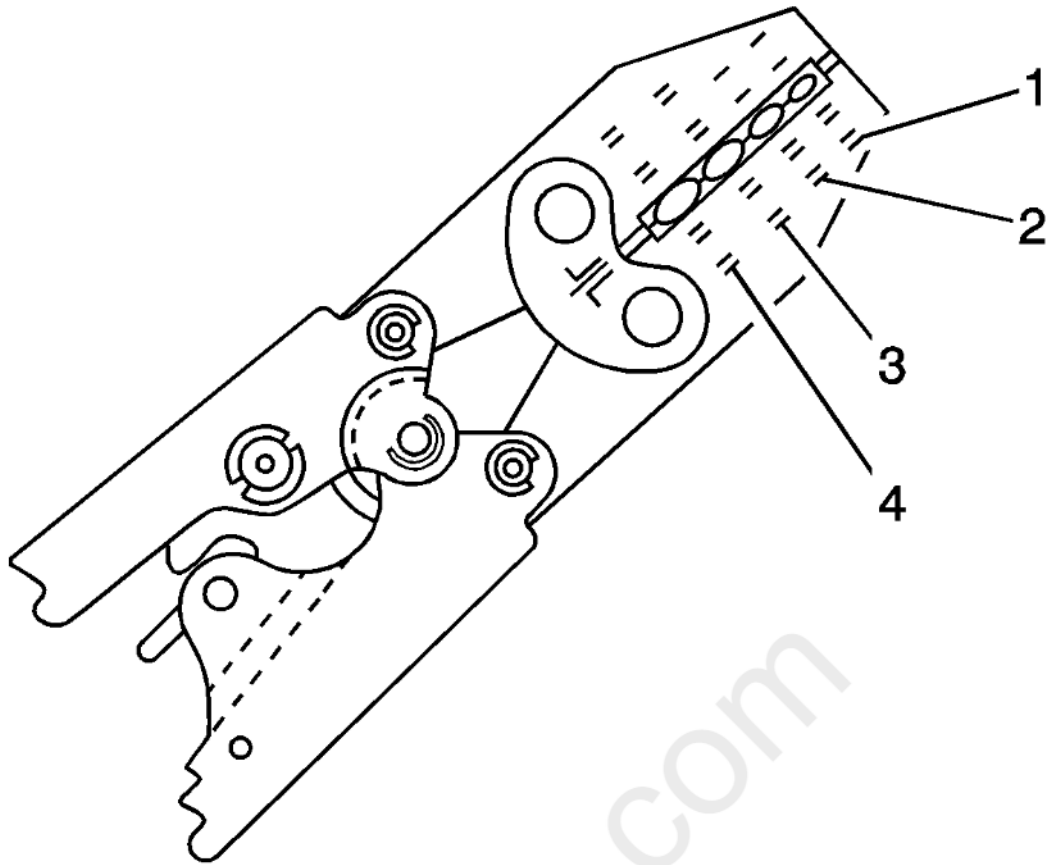


Fig. 18: Crimping Tool

Courtesy of GENERAL MOTORS COMPANY

7. The **J-38125-8** splice sleeve crimping tool has three crimp nests. The largest crimp nest (3) is used for crimping 10 and 12 gauge wires. The second largest crimp nest (2) is used for crimping 14 and 16 gauge wires. The smallest crimp nest (1) is used for crimping 18 to 20 gauge wires. The crimp nests are referenced in the table (farther above) under the crimp tool nest color.

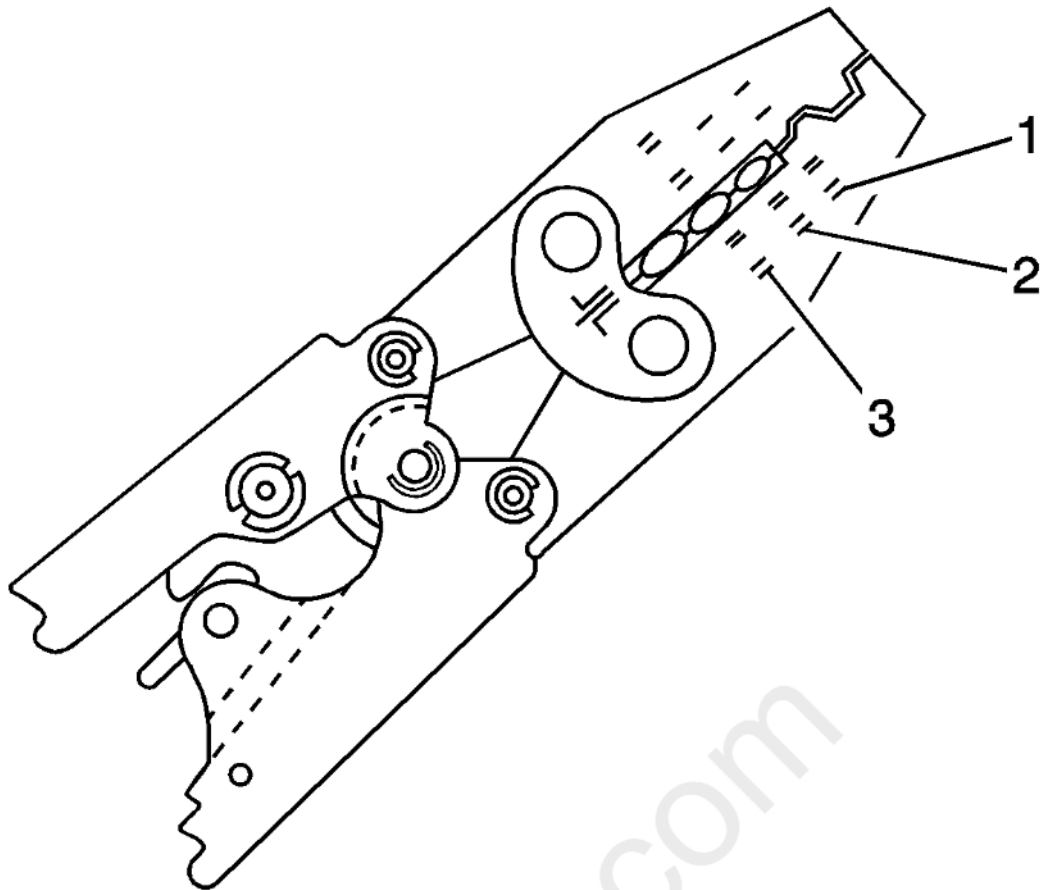


Fig. 19: Identifying Splice Crimp Tool Nests Terminal Identification

Courtesy of GENERAL MOTORS COMPANY

8. Use the splice sleeve crimp tool in order to position the DuraSeal splice sleeve in the proper color nest of the splice sleeve crimp tool. For the four crimp nest tool, use the three largest crimp nests to crimp the splice sleeves. For the three crimp nest tool, use all three crimp nests to crimp the splice sleeves. Use the four and three crimp tool diagrams (above) and the table (farther above) to match the splice sleeve with the correct crimp nest. The crimp tool diagram callout numbers match the numbers in the table (under crimp tool nest color).
9. Place the DuraSeal splice sleeve in the nest. Ensure that the crimp falls midway between the end of the barrel and the stop. The sleeve has a stop (3) in the middle of the barrel (2) in order to prevent the wire (1) from going further. Close the hand crimper handles slightly in order to firmly hold the DuraSeal splice sleeve in the proper nest.

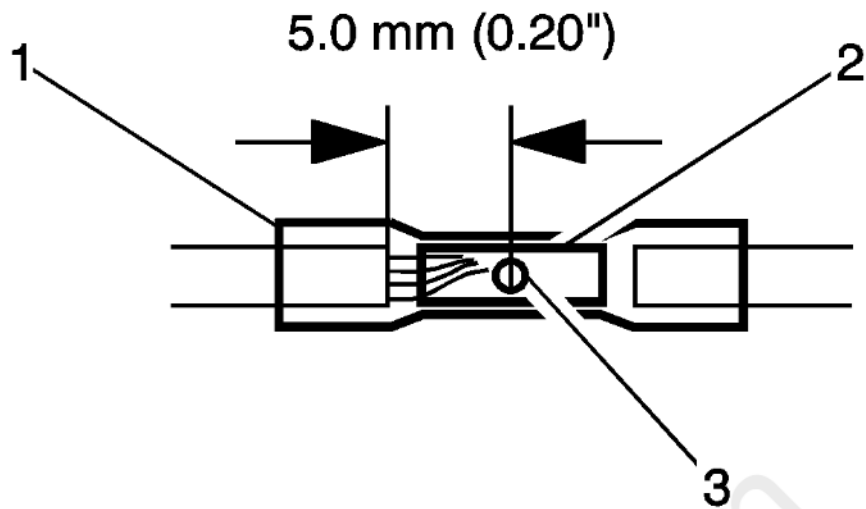


Fig. 20: Identifying Duraseal Splice Sleeve
Courtesy of GENERAL MOTORS COMPANY

10. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.



Fig. 21: Crimped Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

11. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Repeat steps 4 and 6 for the opposite end of the splice.

12. Using the heat torch, apply heat to the crimped area of the barrel.



Fig. 22: Crimped Duraseal Splice Sleeve

Courtesy of GENERAL MOTORS COMPANY

13. Start in the middle and gradually move the heat barrel to the open ends of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

Weatherpack™ Wiring Repair

NOTE: Some replacement pigtail connectors may be delivered without the terminated leads installed into the connector. For Weatherpack™ connectors, all terminated leads included in the package should to be installed into the connector. If the connector end view shows that a terminal is not occupied, the extra terminated lead(s) need to be installed and the end(s) sealed using a DuraSeal splice sleeve and taped back into the harness.

1. Insert the wire into the splice sleeve barrel until the wire hits the barrel stop. Refer to **Folded-Over Wire Repair** for splicing wires of 0.35 mm or less (22, 24, 26 gauge sizes) and for splicing wires of different gauges.

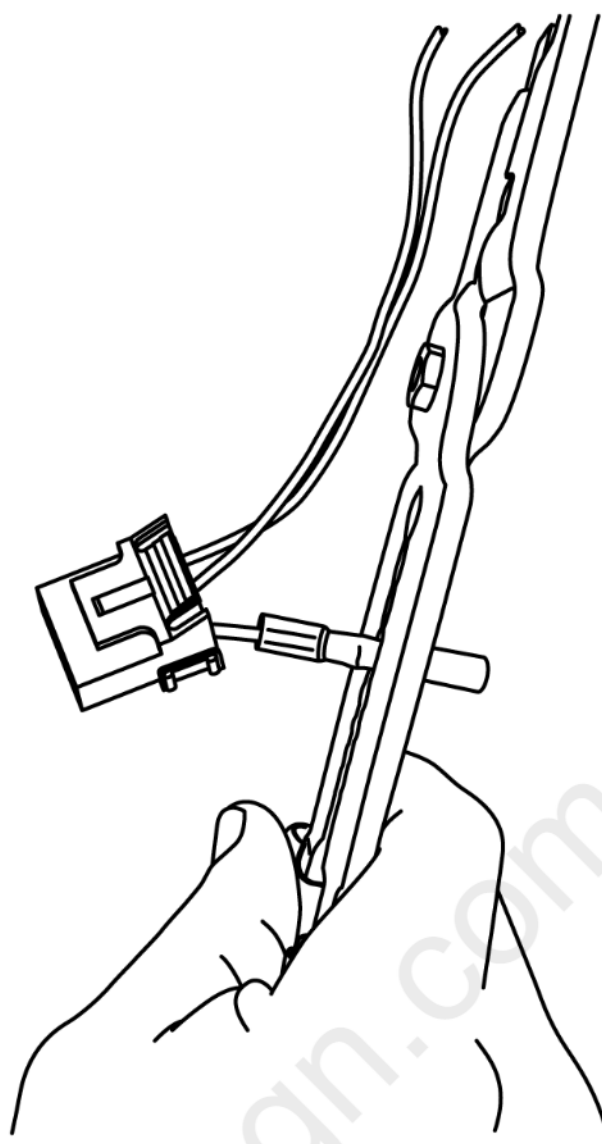


Fig. 23: Tightly Close Handles Of Crimp Tool
Courtesy of GENERAL MOTORS COMPANY

2. Tightly close the handles of the crimp tool until the crimper handles open when released.

The crimper handles will not open until you apply the proper amount of pressure to the DuraSeal splice sleeve. Holding the DuraSEAL with one hand gently tug on the wire to ensure it is crimped in the DuraSeal.

3. Using the heat torch, apply heat to the crimped area of the barrel.
4. Start in the middle and gradually move the heat barrel to the open ends of the tubing:

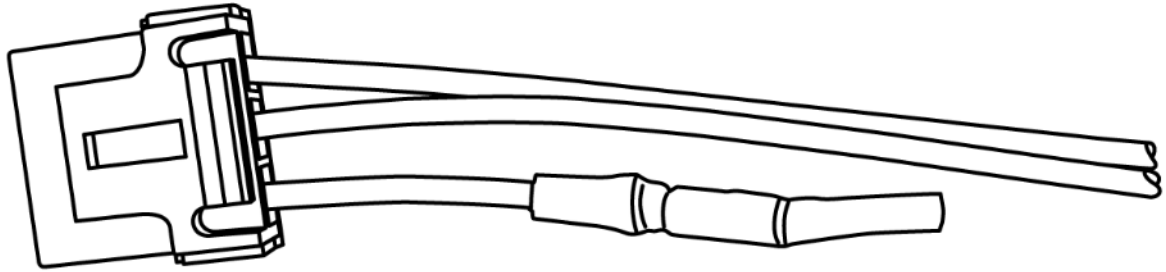


Fig. 24: Heat To Crimped Area Of Barrel

Courtesy of GENERAL MOTORS COMPANY

- The tubing will shrink completely as the heat is moved along the insulation.
- A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.

5. Tape the extra terminated lead(s) back into the harness.

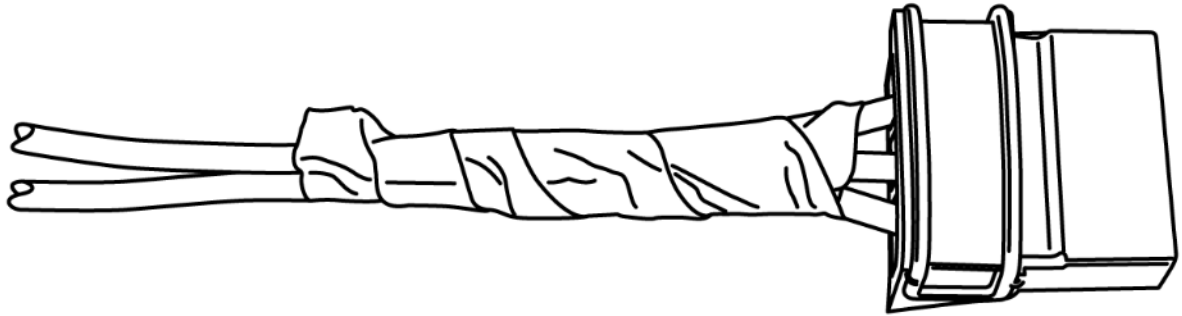


Fig. 25: Taping Extra Terminated Leads Back Into Harness
Courtesy of GENERAL MOTORS COMPANY

High Temperature Wiring Repairs

Use the following procedures to perform high temperature wiring repairs:

1. Center the high temperature SCT1 shrink tube over the DuraSeal splice sleeve.
2. Using the heat torch, apply heat to the high temperature heat shrink tubing.
3. Gradually move the heat from the center to the open end of the tubing:
 - The tubing will shrink completely as the heat is moved along the insulation.
 - A small amount of sealant will come out of the end of the tubing when sufficient shrinkage is achieved.
4. Replace any reflective tape and clips that may have been removed during the repair.

CONNECTOR RECONNECTION - SEATS

Special Tools

EL-35616 Terminal Test Probe Kit

For equivalent regional tools, refer to [Special Tools](#) .

When the condition is not currently present, but is indicated in DTC history, the cause may be intermittent. An intermittent may also be the cause when there is a customer complaint, but the symptom cannot be duplicated. Refer to the Symptom Table of the system that is suspect of causing the condition before trying to locate an intermittent condition.

Most intermittent conditions are caused by faulty electrical connections or wiring. Inspect for the following items:

- Loose, corroded or painted terminal stud/fastener
- Wiring broken inside the insulation
- Poor connection between the male and female terminal at a connector
- A terminal not seated all the way into the connector body
- Poor terminal to wire connection - Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself and corrosion in the wire to terminal contact area, etc.
- Pierced or damaged insulation can allow moisture to enter the wiring causing corrosion. The conductor can corrode inside the insulation, with little visible evidence. Look for swollen and stiff sections of wire in the suspect circuits.
- Wiring which has been pinched, cut or its insulation rubbed through may cause an intermittent open or short as the bare area touches other wiring or parts of the vehicle.
- Wiring that comes in contact with hot or exhaust components
- Refer to [**Inducing Intermittent Fault Conditions**](#) in order to duplicate the conditions required, in order to verify the customer concern.
- Refer to [**Testing for Electrical Intermittents**](#) for test procedures to detect intermittent open, high resistance, short to ground and short to voltage conditions.
- Refer to [**Scan Tool Snapshot Procedure**](#) for advanced intermittent diagnosis and Vehicle Data Recorder operation.

Testing for Terminal Fretting

Some intermittent conditions can be caused by wire terminal fretting corrosion. Fretting corrosion is a build-up of insulating, oxidized wear debris that can form when there is a small motion between electrical contacts. The oxidized wear debris can pile up enough at the electrical contact spots that the electrical resistance across the connection increases. Movement between the contacting surfaces as small as 10 to 100 microns can cause fretting. To put this in perspective, a sheet of paper is about 100 microns thick, so fretting motion is small and hard to see. Vibration and thermal expansion/contraction are the main sources that create fretting motion. Since vehicles vibrate and can experience large temperature swings, they are a good source for fretting motion. Tin, copper, nickel and iron surfaces are all susceptible to fretting corrosion. Fretting corrosion can be difficult to see but it looks like small, dark smudges on the terminals contact surface.

To correct a fretting condition disconnect the suspect connector and add dielectric grease/lubricant (Nyogel 760G or equivalent, meeting GM specification 9986087) to both sides of the connector terminals. Then reconnect the connector and wipe away any excess lubricant. This will correct the additional terminal contact resistance due to the terminal fretting corrosion.

Testing for Proper Terminal Contact

It is important to test terminal contact at the component and any inline connectors before replacing a suspect component. Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

Contamination may be caused by the connector halves being improperly connected. A missing or damaged connector seal, damage to the connector itself or exposing the terminals to moisture and dirt can also cause contamination. Contamination, usually in the underhood or underbody connectors, leads to terminal corrosion, causing an open circuit or intermittently open circuit.

Deformation is caused by probing the mating side of a connector terminal without the proper adapter. Always use the **EL-35616** kit when probing connectors. Other causes of terminal deformation are improperly joining the connector halves or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

Testing for Proper Terminal Contact in Bussed Electrical Centers

It is very important to use the correct test adapter when testing for proper terminal contact of fuses and relays in a bussed electrical center. Use the **EL-35616** kit to test for proper terminal contact. Failure to use the **EL-35616** kit can result in improper diagnosis of the bussed electrical center.

Follow the procedure below in order to test terminal contact:

1. Separate the connector halves.
2. Visually inspect the connector halves for contamination. Contamination may result in a white or green build-up within the connector body or between terminals. This causes high terminal resistance, intermittent contact or an open circuit. An underhood or underbody connector that shows signs of contamination should be replaced in its entirety: terminals, seals and connector body.
3. Using an equivalent male terminal/terminated lead, verify that the retention force is significantly different between a known good terminal and the suspect terminal. Replace the female terminal in question.

Flat Wire Connectors

There are no serviceable parts for flat wire connectors on the harness side or the component side.

Follow the procedure below in order to test terminal contact:

1. Remove the component in question.
2. Visually inspect each side of the connector for signs of contamination. Avoid touching either side of the connector as oil from your skin may be a source of contamination as well.
3. Visually inspect the terminal bearing surfaces of the flat wire circuits for splits, cracks or other imperfections that could cause poor terminal contact. Visually inspect the component side connector to ensure that all of the terminals are uniform and free of damage or deformation.
4. Insert the appropriate adapter into the flat wire harness connector in order to test the circuit in question.

Control Module/Component Voltage and Grounds

Poor voltage or ground connections can cause widely varying symptoms.

- Test all control module voltage supply circuits. Many vehicles have multiple circuits supplying voltage to a control module. Other components in the system may have separate voltage supply circuits that may also need to be tested. Inspect connections at the module/component connectors, fuses and any intermediate connections between the voltage source and the module/component. A test lamp or a DMM may indicate that voltage is present, but neither tests the ability of the circuit to carry sufficient current. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and [Power Distribution Schematics](#).
- Test all control module ground and system ground circuits. The control module may have multiple ground circuits. Other components in the system may have separate grounds that may also need to be tested. Inspect grounds for clean and tight connections at the grounding point (screw or stud). Inspect the connections at the component and in splice packs, where applicable. Operate the component to test the ability of the circuit to carry sufficient current. Refer to [Circuit Testing](#) and [Ground Distribution Schematics](#).

Temperature Sensitivity

- An intermittent condition may occur when a component/connection reaches normal operating temperature. The condition may occur only when the component/connection is cold or only when the component/connection is hot.
- Freeze Frame, Failure Records, Snapshot or Vehicle Data Recorder data may help with this type of intermittent condition, where applicable.
- If the intermittent is related to heat, review the data for a relationship with the following:
 - High ambient temperatures
 - Underhood/engine generated heat
 - Circuit generated heat due to a poor connection or high electrical load

- Higher than normal load conditions, towing, etc.
- If the intermittent is related to cold, review the data for the following:
 - Low ambient temperatures - In extremely low temperatures, ice may form in a connection or component. Inspect for water intrusion.
 - The condition only occurs on a cold start.
 - The condition goes away when the vehicle warms up.
- Information from the customer may help to determine if the trouble follows a pattern that is temperature related.
- If temperature is suspected of causing an intermittent fault condition, attempt to duplicate the condition. Refer to [Inducing Intermittent Fault Conditions](#) in order to duplicate the conditions required.

Electromagnetic Interference and Electrical Noise

Some electrical components/circuits are sensitive to electromagnetic interference or other types of electrical noise. Inspect for the following conditions:

- A mis-routed harness that is too close to high voltage/high current devices such as secondary ignition components, motors, generator etc. - These components may induce electrical noise on a circuit that could interfere with normal circuit operation.
- Electrical system interference caused by a malfunctioning relay or a control module driven solenoid or switch - These conditions can cause a sharp electrical surge. Normally, the condition will occur when the malfunctioning component is operating.
- Installation of non-factory or aftermarket add on accessories such as lights, 2-way radios, amplifiers, electric motors, remote starters, alarm systems, cell phones, etc. - These accessories may create interference in other circuits while operating and the interference would disappear when the accessory is not operating. Refer to [Checking Aftermarket Accessories](#).
- Test for an open diode across the A/C compressor clutch and for other open diodes. Some relays may contain a clamping diode.
- The generator may be allowing AC noise into the electrical system.

Incorrect Control Module

- There are only a few situations where reprogramming a control module is appropriate:
 - A new service control module is installed.
 - A control module from another vehicle is installed.
 - Revised software/calibration files have been released for this vehicle.
- Verify that the control module contains the correct software/calibration. If incorrect programming is found, reprogram the control module with the most current software/calibration. Refer to [Control Module References](#) for replacement, setup and programming.

NOTE: DO NOT re-program the control module with the SAME software/calibration files that are already present in the control module. This is not an effective repair for any type of concern.

DRIVER OR PASSENGER SEAT ADJUSTER SWITCH REPLACEMENT

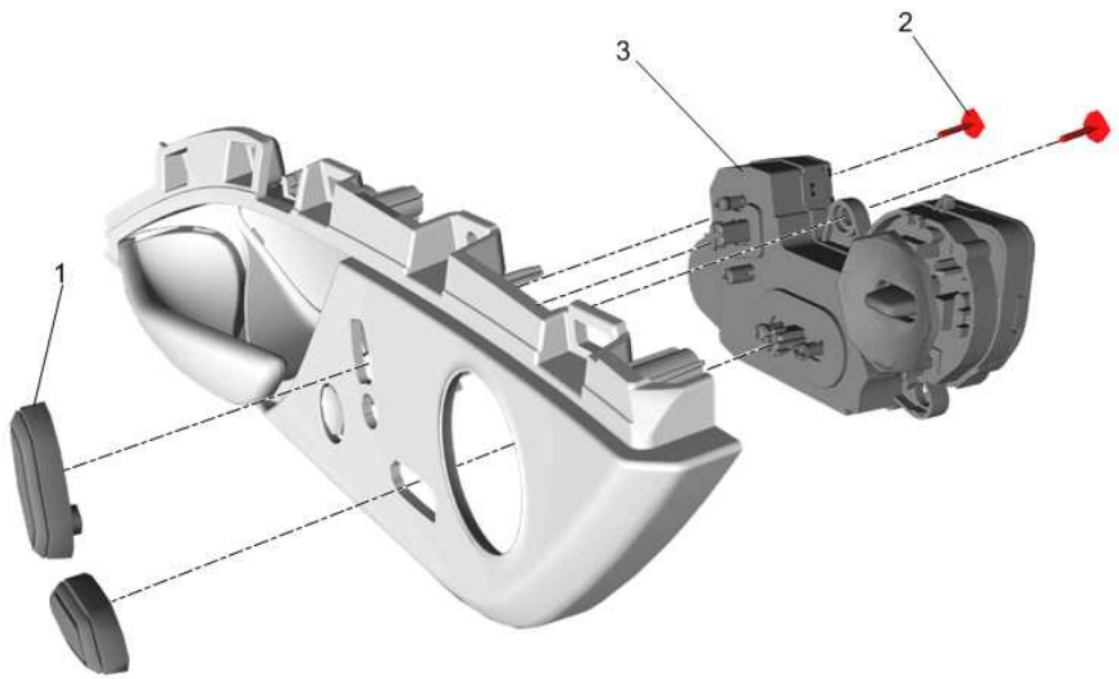


Fig. 26: Driver or Passenger Seat Adjuster Switch

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
<u>Front Side Door Inside Handle Replacement</u>	
1	Driver or Passenger Seat Adjuster Knob [2x]
2	Driver or Passenger Seat Adjuster Switch Fastener [2x] CAUTION: Refer to <u>Fastener Caution</u> . Tighten 1.3 N.m (12 lb in)
3	Driver or Passenger Seat Adjuster Switch

FRONT SEAT ADJUSTER MEMORY SWITCH BEZEL REPLACEMENT

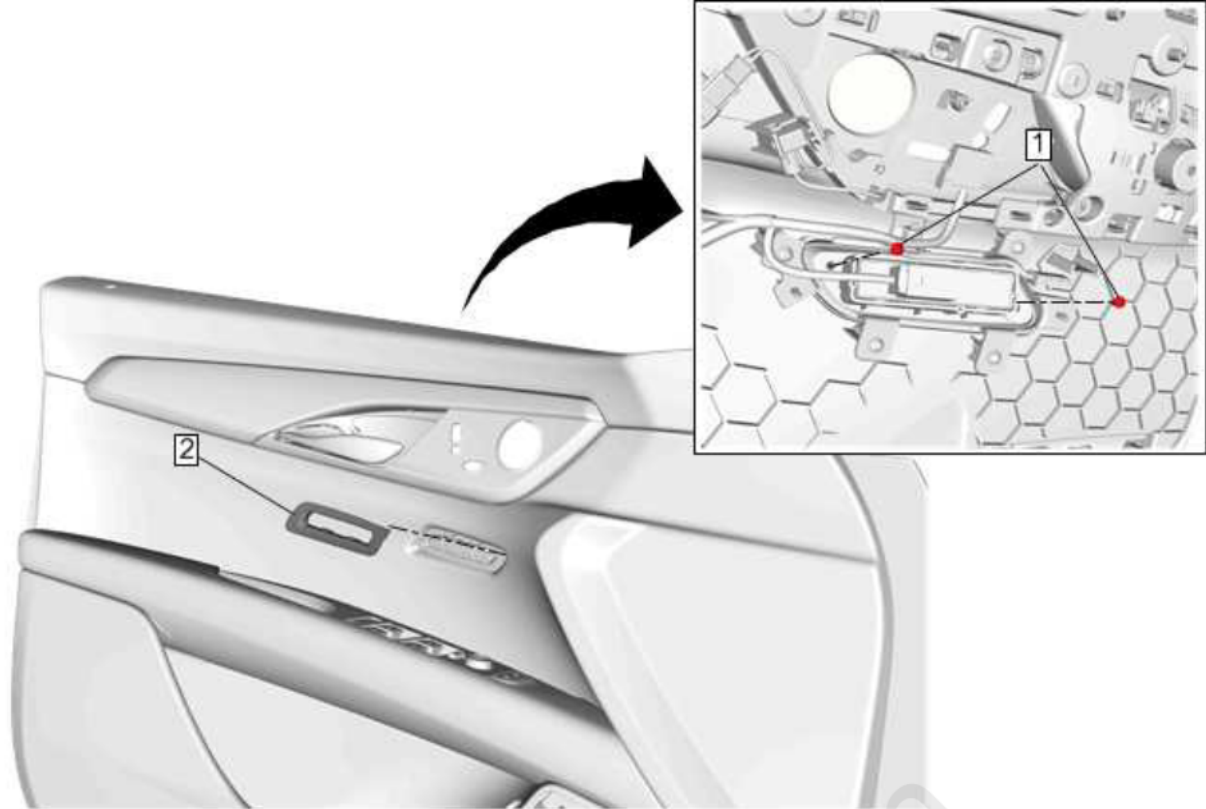


Fig. 27: Front Seat Adjuster Memory Switch Bezel
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Front Side Door Trim Replacement - Front Side Door Insulator Å, Å»Reposition	
1	Front Seat Adjuster Memory Switch Bezel Fastener [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Front Seat Adjuster Memory Switch Bezel

FRONT SEAT ADJUSTER MEMORY SWITCH REPLACEMENT

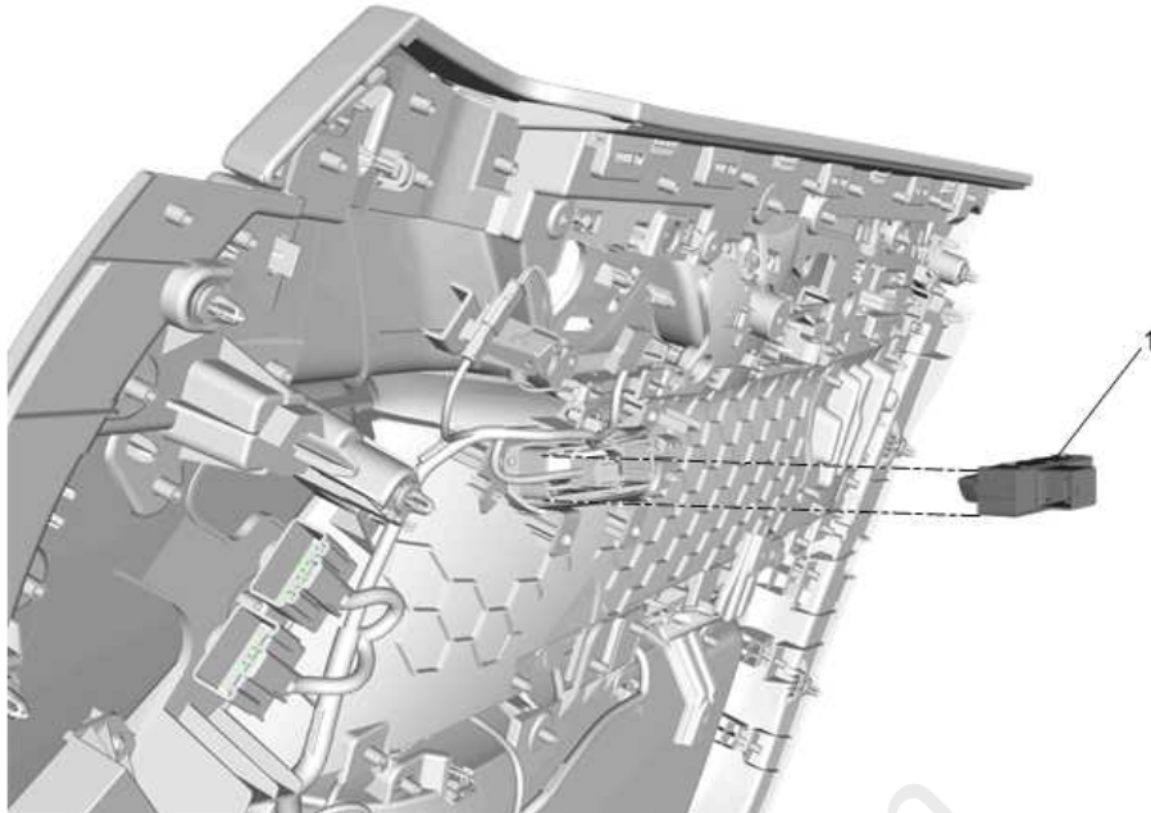


Fig. 28: Front Seat Adjuster Memory Switch
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures Front Side Door Trim Replacement - Front Side Door Insulator &»Reposition	
1	Front Seat Adjuster Memory Switch Procedure Disconnect the electrical connector.

FRONT SEAT ADJUSTER MEMORY MODULE BRACKET REPLACEMENT

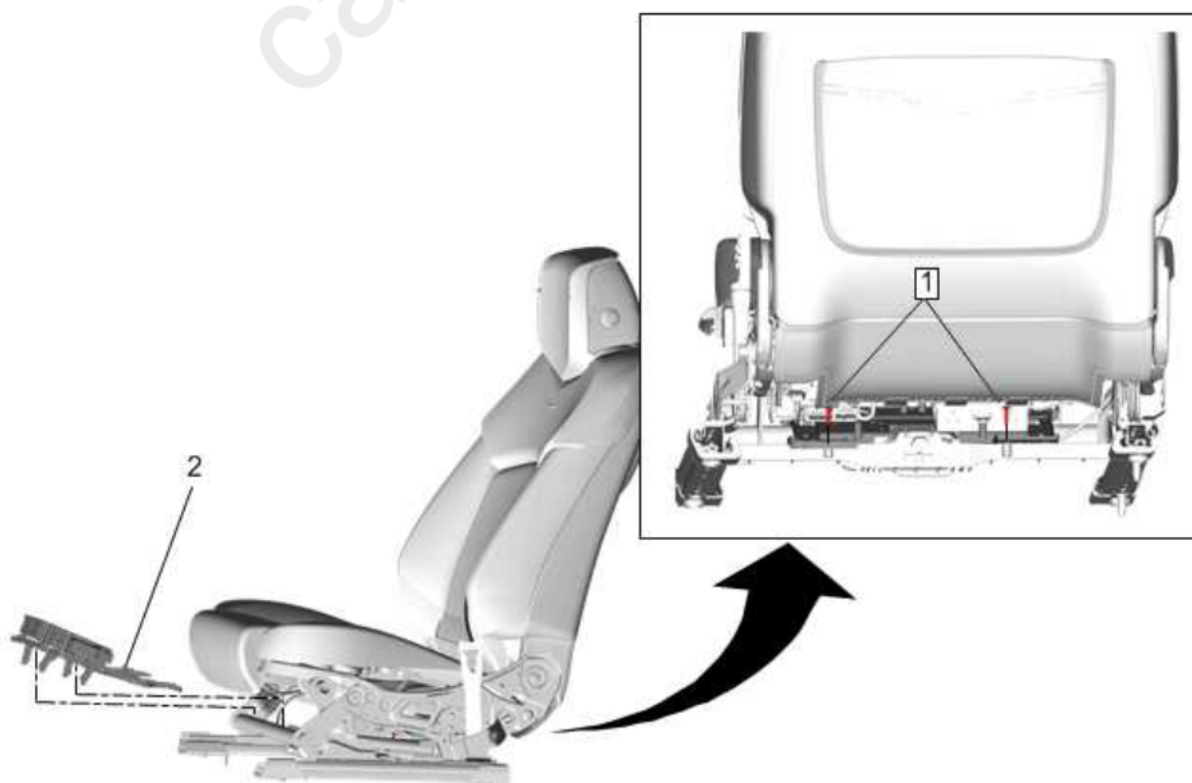


Fig. 29: Front Seat Adjuster Memory Module Bracket
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Driver or Passenger Seat Removal and Installation	
1	Front Seat Adjuster Memory Module Bracket Fastener [2x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Front Seat Adjuster Memory Module Bracket Procedure 1. Disconnect all electrical connectors. 2. Release the retaining tabs. 3. Transfer components as necessary.

DRIVER OR PASSENGER SEAT ADJUSTER MEMORY MODULE REPLACEMENT

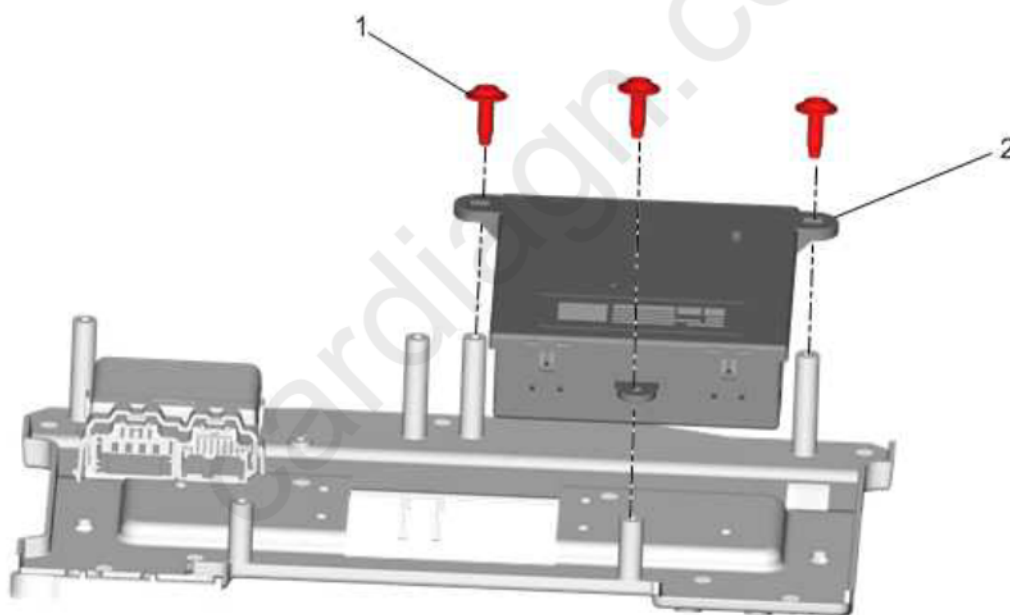


Fig. 30: Driver or Passenger Seat Adjuster Memory Module
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Front Seat Adjuster Memory Module Bracket Replacement	
Empty space for procedure details	

Callout	Component Name
1	Driver or Passenger Seat Adjuster Memory Module Fastener [3x] CAUTION: Refer to Fastener Caution . Tighten 2.5 N.m (22 lb in)
2	Driver or Passenger Seat Adjuster Memory Module Procedure 1. Disconnect all electrical connectors. 2. Control Module References for programming and setup information, if required.

REAR SEAT ADJUSTER MEMORY MODULE REPLACEMENT

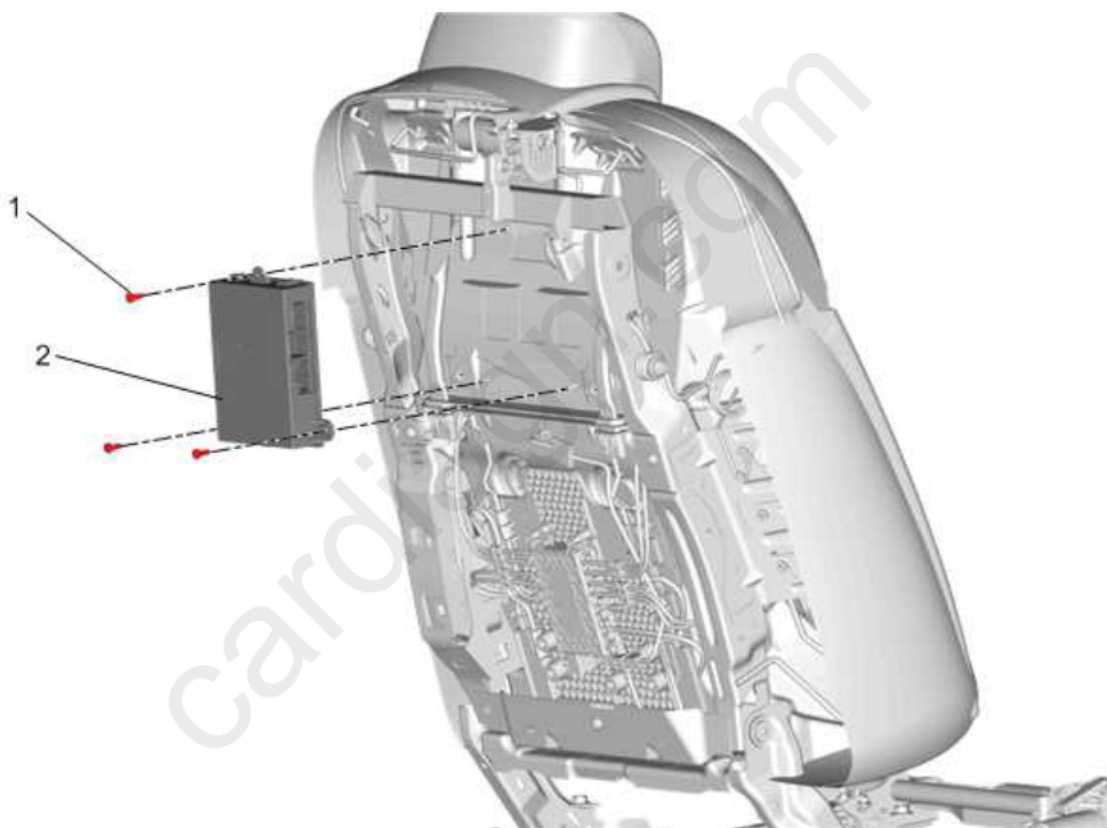


Fig. 31: Rear Seat Adjuster Memory Module
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Seat Removal and Installation	
1	Rear Seat Adjuster Memory Module Screw [3x] CAUTION: Refer to Fastener Caution . Tighten 4.5 N.m (40 lb in)

Callout	Component Name
2	Rear Seat Adjuster Memory Module Procedure 1. Disconnect all electrical connectors. 2. Control Module References for programming and setup information, if required.

REAR SEAT ADJUSTER REPLACEMENT

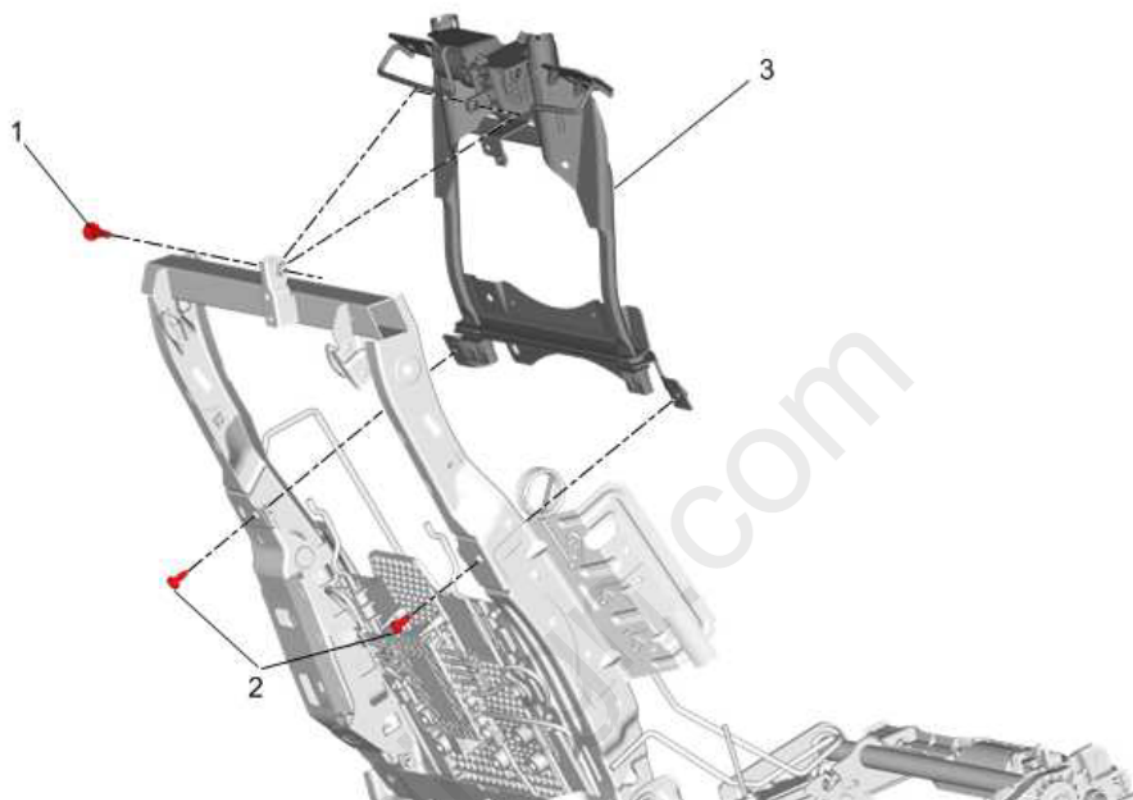


Fig. 32: Rear Seat Adjuster

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Rear Seat Back Cushion Support Replacement	
1	Rear Seat Adjuster Bolt CAUTION: Refer to Fastener Caution . Tighten 10 N.m (89 lb in)
2	Rear Seat Adjuster Screw [2x] Tighten 10 N.m (89 lb in)
3	Rear Seat Adjuster Procedure Transfer components as necessary.

REAR SEAT ADJUSTER SWITCH REPLACEMENT

Removal Procedure

1. Console Bezel (1) ⌘Remove

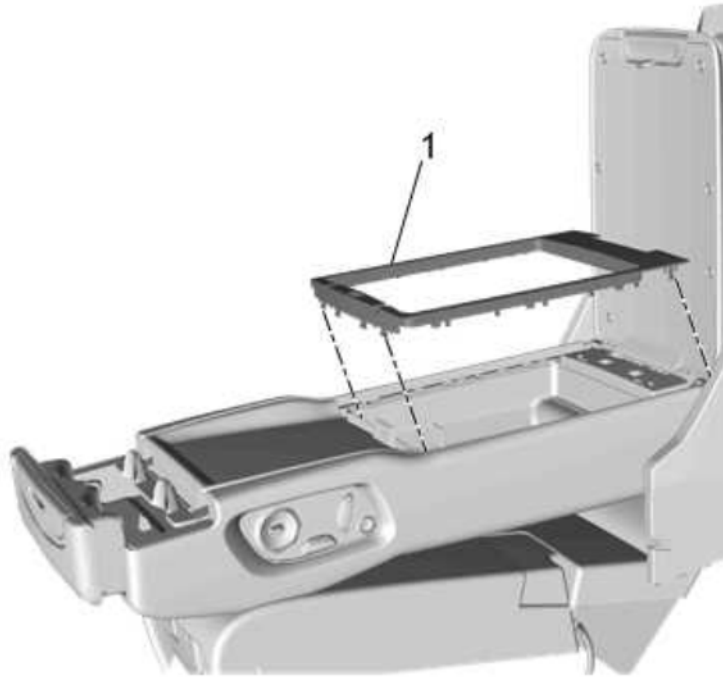


Fig. 33: Console Bezel

Courtesy of GENERAL MOTORS COMPANY

2. Armrest Cover (1) ⌘Remove



Fig. 34: Armrest Cover

Courtesy of GENERAL MOTORS COMPANY

3. Switch Retainer Screw (1) ⌘Remove [3x]

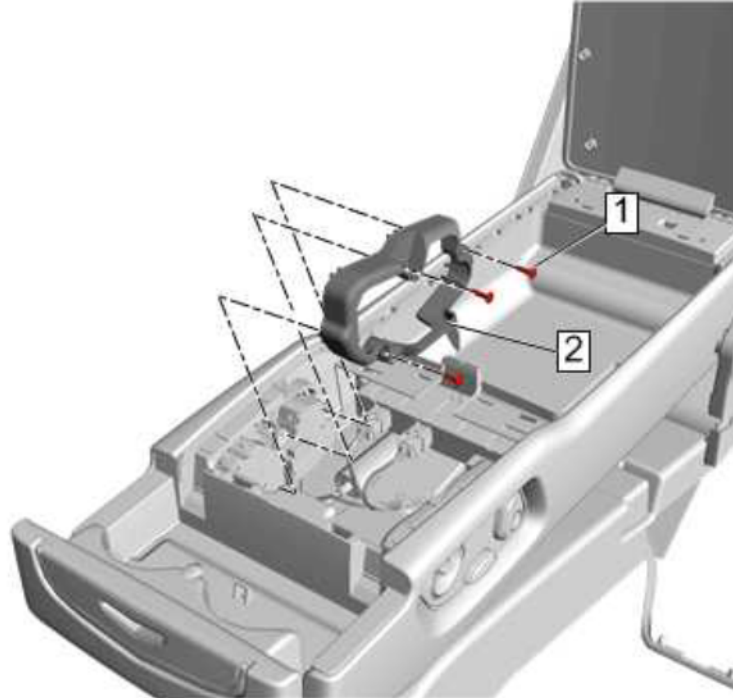


Fig. 35: Switch Retainer And Screws

Courtesy of GENERAL MOTORS COMPANY

4. Switch Retainer (2) Æ, Â»Remove
5. Rear Seat Adjuster Knob (1) Æ, Â»Remove [2x]

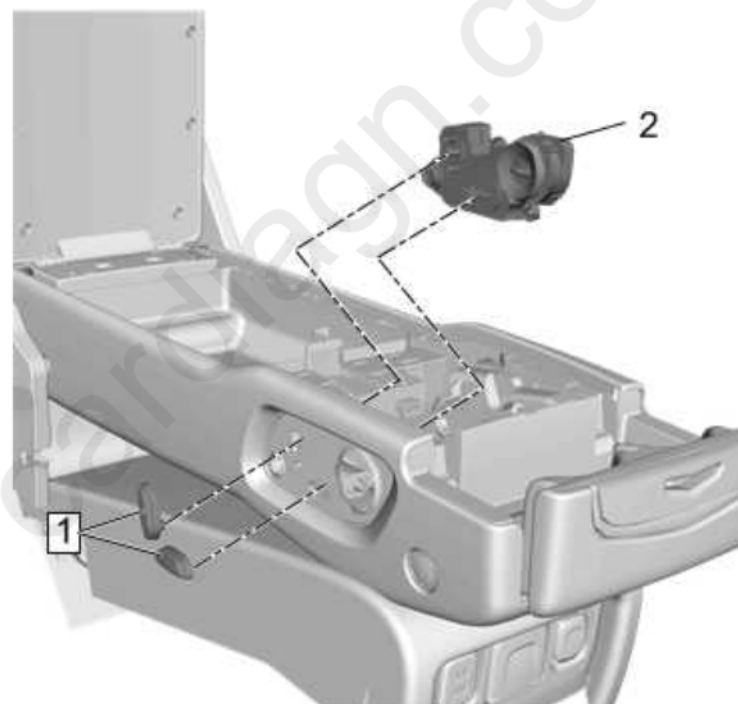


Fig. 36: Rear Seat Adjuster Switch And Knobs

Courtesy of GENERAL MOTORS COMPANY

6. Rear Seat Adjuster Switch (2) Æ, Â»Remove
7. Disconnect the electrical connector.

Installation Procedure

1. Rear Seat Adjuster Switch (2) Æ, Â» Install

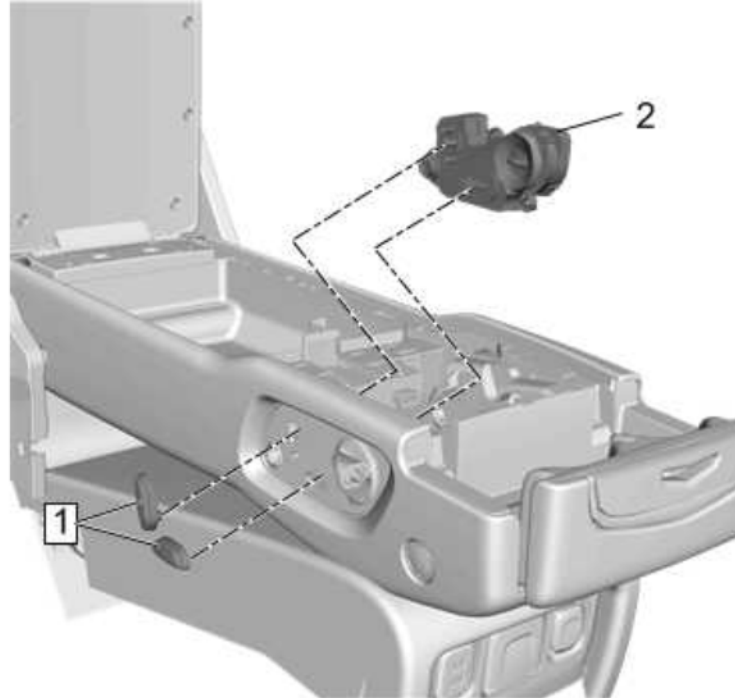


Fig. 37: Rear Seat Adjuster Switch And Knobs
Courtesy of GENERAL MOTORS COMPANY

2. Rear Seat Adjuster Knob (1)» Install [2x]
3. Connect the electrical connector.
4. Switch Retainer (2)» Install

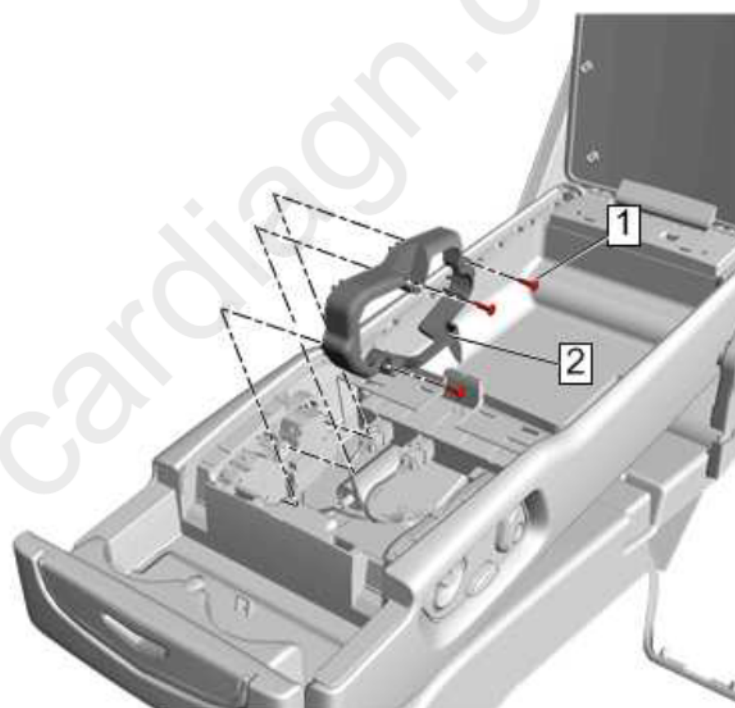


Fig. 38: Switch Retainer And Screws
Courtesy of GENERAL MOTORS COMPANY

5. Switch Retainer Screw (1)» Install and tighten [3x] 2.5 N.m (22 lb in)

CAUTION: Refer to [Fastener Caution](#) .

6. Armrest Cover (1)» Install



Fig. 39: Armrest Cover

Courtesy of GENERAL MOTORS COMPANY

7. Console Bezel (1)» Install



Fig. 40: Console Bezel

Courtesy of GENERAL MOTORS COMPANY

FRONT SEAT BACK MASSAGE BLADDER REPLACEMENT



Fig. 41: Front Seat Back Massage Bladder
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Driver or Passenger Seat Back Cover and Pad Replacement</u>	
1	Front Seat Back Massage Bladder Procedure 1. Disconnect the air hoses. 2. Release the retainer tabs from the seat back cushion pad.

FRONT SEAT LUMBAR SUPPORT BLADDER PUMP REPLACEMENT

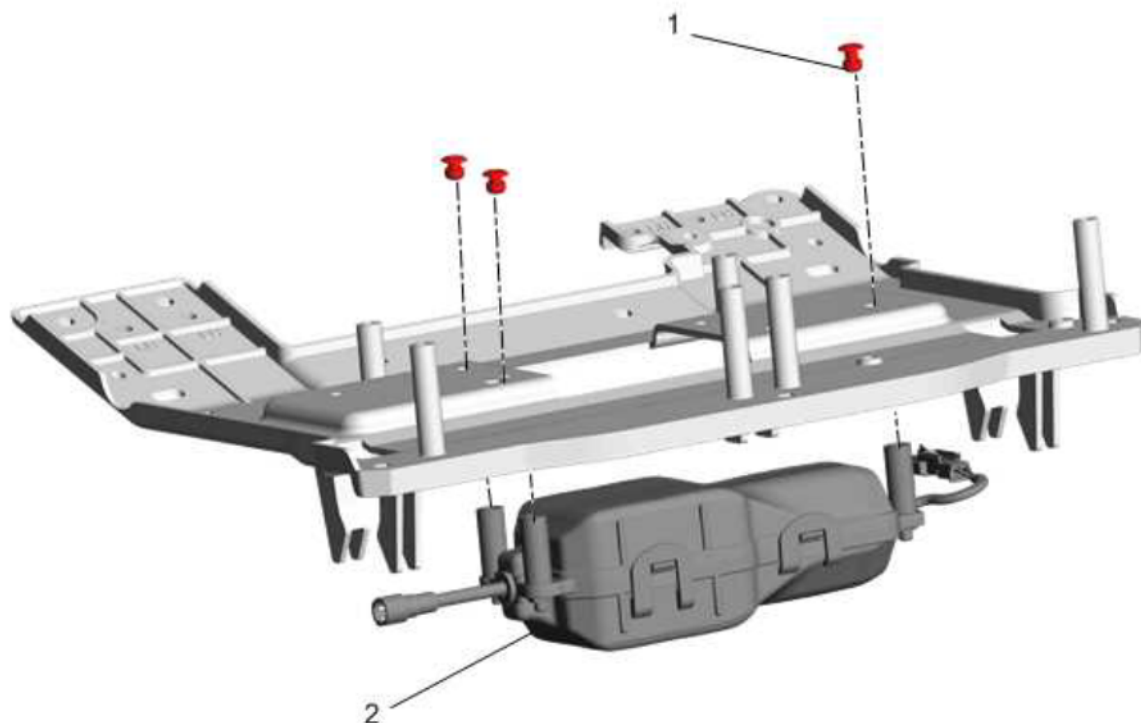


Fig. 42: Front Seat Lumbar Support Bladder Pump
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
WARNING: Refer to Eye Protection Warning .	
Preliminary Procedure Front Seat Adjuster Memory Module Bracket Replacement	
1	Front Seat Lumbar Support Bladder Pump Rivet [3x]
2	Front Seat Lumbar Support Bladder Pump Procedure 1. Disconnect the electrical connector. 2. Disconnect the air hose.

FRONT SEAT BACK LUMBAR BLADDER REPLACEMENT

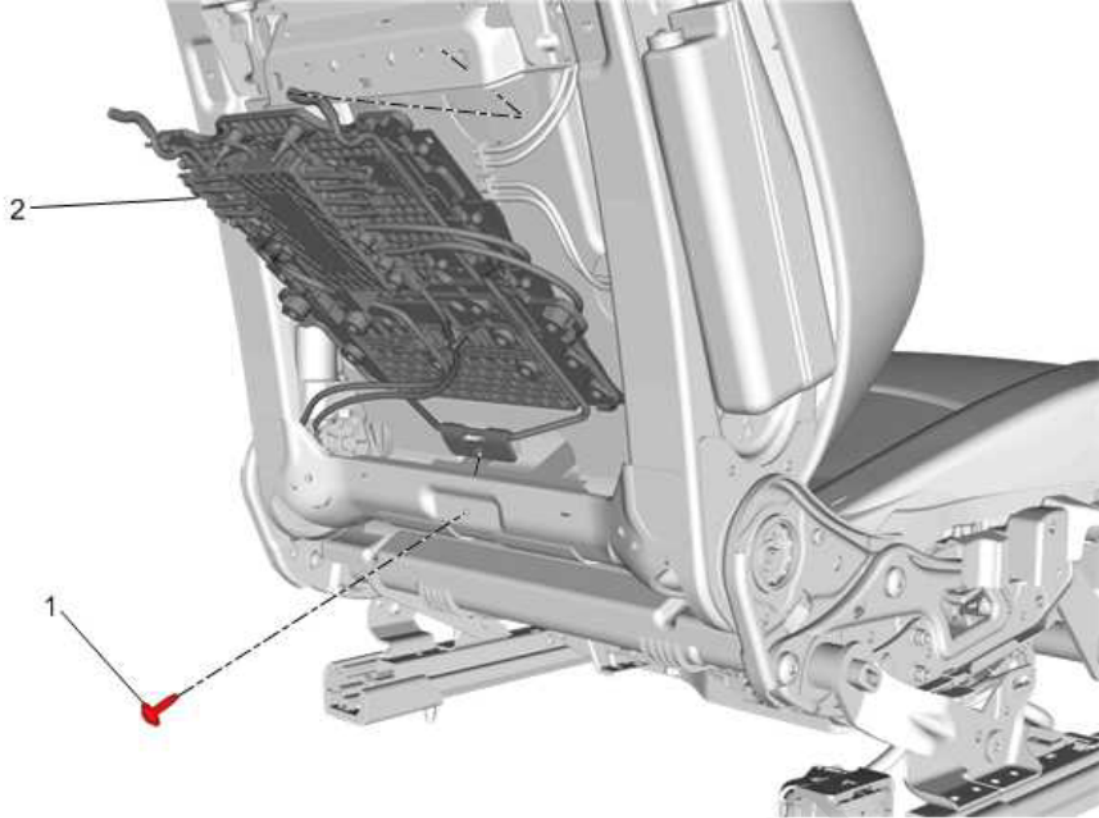


Fig. 43: Front Seat Back Lumbar Bladder
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Driver or Passenger Seat Removal and Installation</u> <u>Front Seat Back Cushion Finish Panel Replacement (without UWG)</u> <u>Front Seat Back Cushion Finish Panel Replacement (with UWG)</u> <u>Driver or Passenger Seat Back Cover and Pad Replacement</u> » Reposition	
1	Front Seat Back Lumbar Bladder Fastener CAUTION: Refer to <u>Fastener Caution</u> . Tighten 10 N.m (89 lb in)
2	Front Seat Back Lumbar Bladder - Disconnect the electrical connectors. - Disconnect the air hoses.

REAR SEAT LUMBAR SUPPORT REPLACEMENT

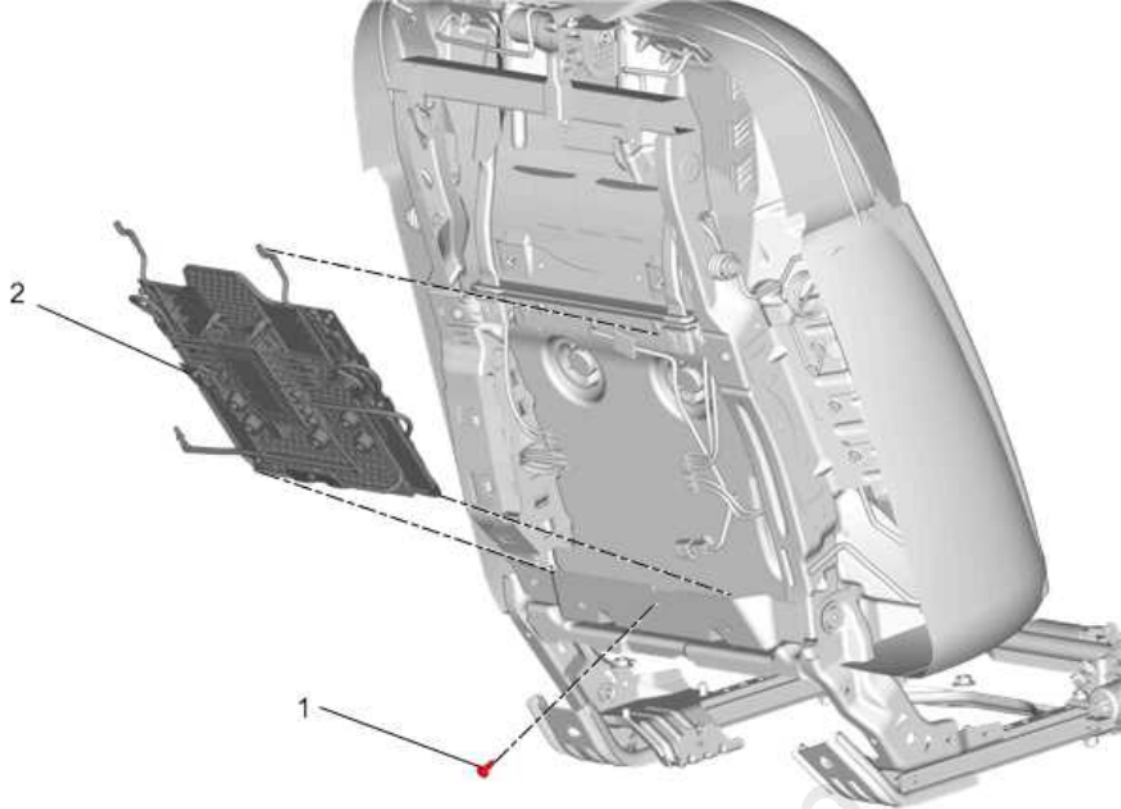


Fig. 44: Rear Seat Lumbar Support
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Rear Seat Removal and Installation</u> - Reposition the seat back cushion cover. Refer to <u>Rear Seat Back Cushion Cover and Pad Replacement (except Platinum)</u> and/or <u>Rear Seat Back Cushion Cover and Pad Replacement (Platinum)</u>	
1	Rear Seat Lumbar Support Fastener CAUTION: Refer to <u>Fastener Caution</u> . Tighten 10 N.m (89 lb in)
2	Rear Seat Lumbar Support Procedure - Disconnect the air hoses. - Disconnect the electrical connectors.

REAR SEAT LUMBAR SUPPORT BLADDER REPLACEMENT



Fig. 45: Rear Seat Lumbar Support Bladder
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Rear Seat Back Cushion Cover and Pad Replacement (except Platinum) Rear Seat Back Cushion Cover and Pad Replacement (Platinum)</u>	
1	Rear Seat Lumbar Support Bladder Procedure 1. Disconnect the air hoses. 2. Release the retainer tabs from the seat back cushion pad.

REAR SEAT LUMBAR SUPPORT BLADDER PUMP REPLACEMENT

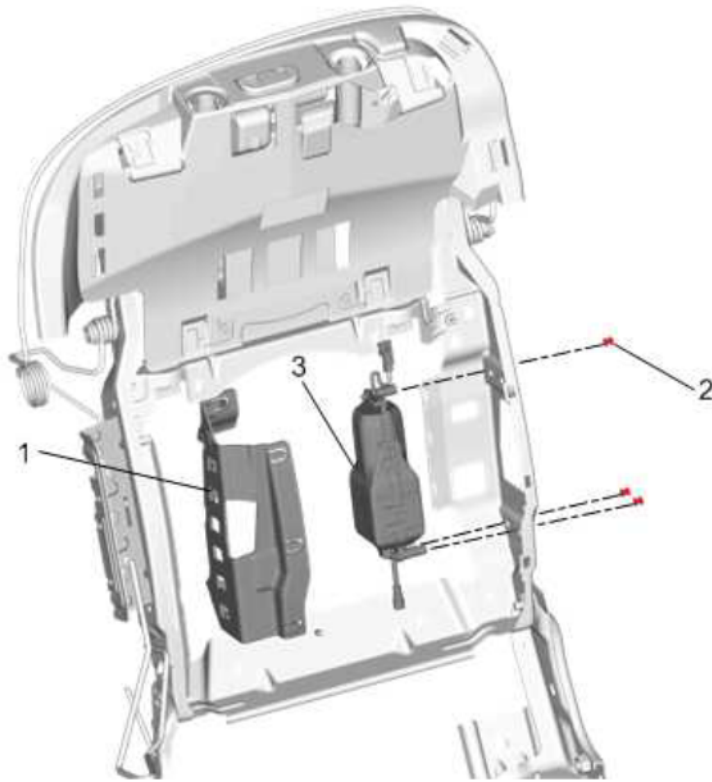


Fig. 46: Rear Seat Lumbar Support Bladder Pump
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure <u>Rear Seat Back Cushion Cover and Pad Replacement (except Platinum)</u> <u>Rear Seat Back Cushion Cover and Pad Replacement (Platinum)</u>	
1	Rear Seat Lumbar Support Bladder Pump Shield
2	Rear Seat Lumbar Support Bladder Pump Rivet [3x]
3	Rear Seat Lumbar Support Bladder Pump Procedure 1. Disconnect the electrical connector. 2. Disconnect the air hose.

FRONT SEAT WIRING HARNESS REPLACEMENT

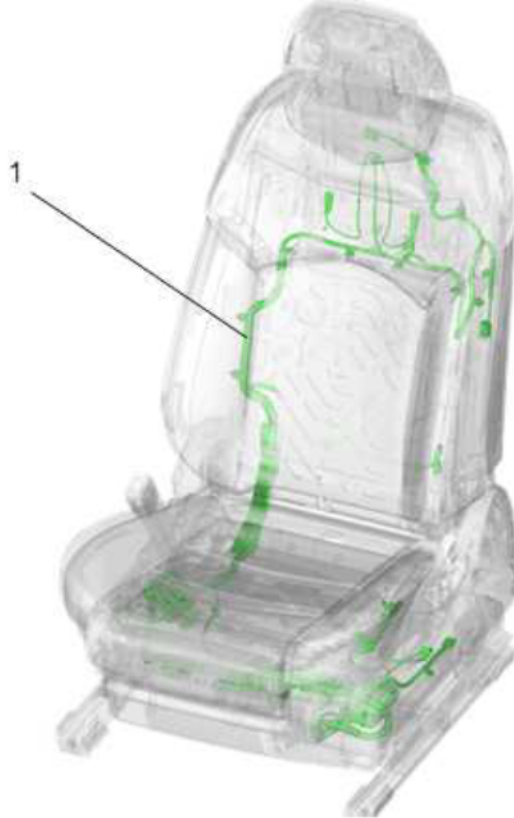


Fig. 47: Front Seat Wiring Harness
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. <u>Driver or Passenger Seat Removal and Installation</u> 2. <u>Driver or Passenger Seat Back Cover and Pad Replacement</u> 3. <u>Front Seat Cushion Cover and Pad Replacement</u>	
1	Front Seat Wiring Harness NOTE: Typical wiring harness shown, individual harness may be different due to option content. Procedure <u>Control Module References</u> for programming and setup information, if required.

REAR SEAT WIRING HARNESS REPLACEMENT

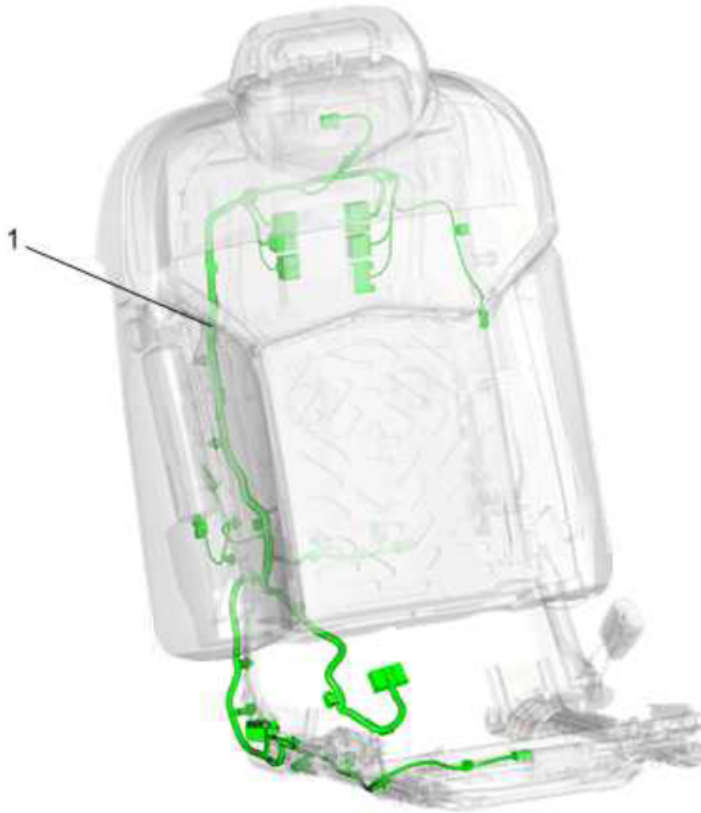


Fig. 48: Rear Seat Wiring Harness
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures <u>Rear Seat Removal and Installation</u> <u>Rear Seat Back Cushion Cover and Pad Replacement (except Platinum) Rear Seat Back Cushion Cover and Pad Replacement (Platinum)</u>	
1	Rear Seat Wiring Harness NOTE: Typical wiring harness shown, individual harness may be different due to option content.

DESCRIPTION AND OPERATION

LUMBAR SUPPORT DESCRIPTION AND OPERATION (2-WAY WITH MEMORY A45)

Lumbar Support Components

The driver seat lumbar support system with memory (A45) consists of the following components:

- Seat adjuster switch
- Seat memory control module
- Seat lumbar support horizontal motor

Lumbar Circuit Description

S64D
 Seat

Adjuster
Switch -
Driver



K40
Seat

Seat
Memory
Control
Module



M52D

cardiagn.com

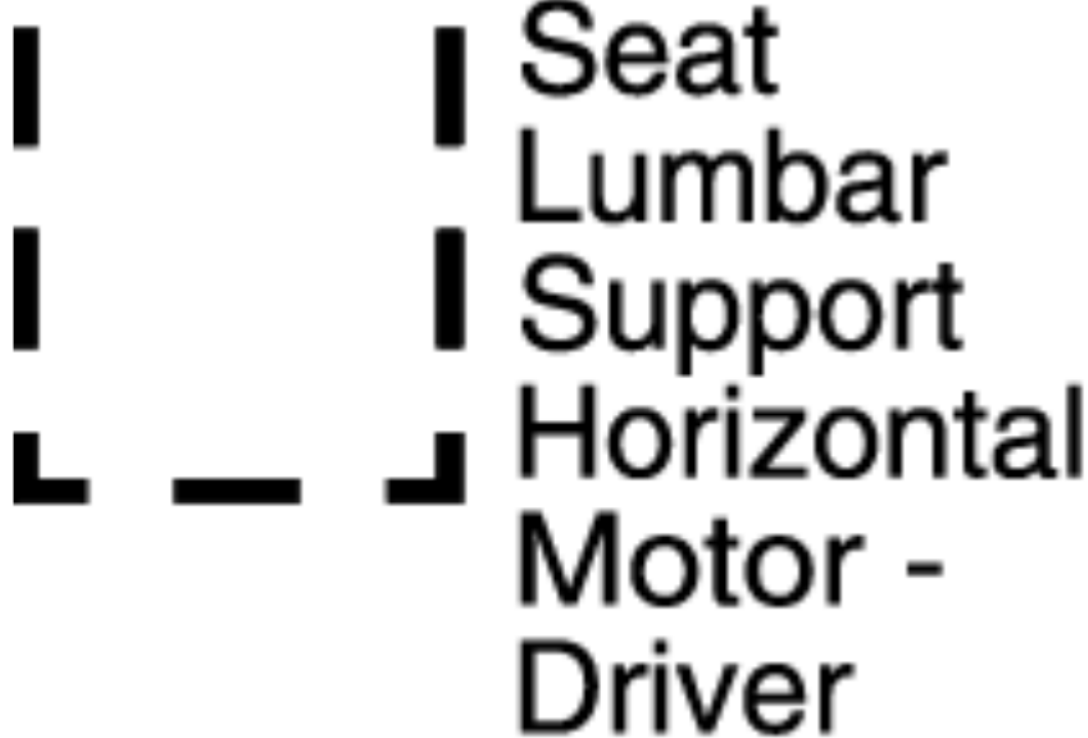


Fig. 49: Lumbar Circuit Block Diagram

Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
S64D	S64D Seat Adjuster Switch - Driver
K40	K40 Seat Memory Control Module
M52D	M52D Seat Lumbar Support Horizontal Motor - Driver

Ground is supplied at all times to the driver seat adjuster switch through the switch ground circuit and ground connection. The seat memory control module supplies a low current voltage to each signal circuit of the seat lumbar support switch. When the seat switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the lumbar command. In response to this signal, the seat memory control module applies battery voltage through the driver seat lumbar motor forward control circuit and ground through the driver seat lumbar motor rearward control circuit to the motor. The motor runs to drive the lumbar support forward towards the occupants back until the switch is released. Moving the lumbar support rearward works similarly to moving the lumbar support forward, except that battery positive voltage and ground are applied on the opposite

LUMBAR SUPPORT DESCRIPTION AND OPERATION (WITH SEAT BOLSTER MEMORY CONTROL MODULE)

The memory lumbar/bolster system uses air bladders to adjust various aspects of the seat configuration to meet an occupant's preference. It also allows these adjustments to be stored to a memory position along with the seat position data.

Some vehicles may also be equipped with dynamic mode control which gives the chassis subsystem the ability to request an automatic adjustment to the seat's bolster support depending on vehicle driving conditions.

The various seat adjustments and functionality which may be possible include:

- Lumbar support - forward and rearward
- Lumbar support - up and down
- Seat back side bolster
- Back massage functionality

The components of the system include:

- LIN based seat switch
- Bolster memory control module
- Radio
- Information display
- Seat memory control module
- Seat air pump motor
- Air bladders

LIN Seat Switch

The seat switch communicates all customer requests for seat movement or adjustment via the LIN serial data bus to the seat memory control module. The seat switch may consist of the following controls:

- Seat adjuster switch similar to the typical discrete seat switch
- Massage On/Off switch, if massage is equipped
- 4-way multi-function switch which can be activated Up/Down/Forward/Rearward
- Feature select rotary ring around the outside of the 4-way multi-function Switch

Manipulating the seat cushion and seat back control bar results in the seat memory control module responding in the same way as it would if the resultant requests were made by discrete signals instead of the LIN messaging this switch employs.

Information Feature Display

Due to the number of pneumatic lumbar/bolster features available and that the 4-way multi-function switch controls different operations depending on feature selection, the information display is used for the visual feedback of the feature selected as well as which operations of the feature are under the control of the 4-way multi-function switch.

The seat memory control module will track and maintain which lumbar/bolster features are available on the vehicle as well as the current feature selection and its settings. This information is communicated via GMLAN to the radio tuner which in turn communicates it to the information interface for display. The display will show a seat image with the specific selected feature highlighted. In addition, arrows and text will indicate the functions to be adjusted by the 4-way multi-function switch.

If the seat selection menu is not showing on the display, adjusting the lumbar/bolster seat switches will bring this menu up. Only when the display is active and the various features are displayed by the infotainment system, then customer can then use the rotary ring to move up or down the feature menu. The display will show a seat image with the specific selected feature highlighted along with arrows and text to indicate the functions to be adjusted by the 4-way multi-function switch.

Lumbar/Bolster Operation

Once the lumbar/bolster feature has been selected, the seat memory control module will command the seat bolster memory control module to perform the required pneumatic movements via LIN serial data messages.

The seat bolster memory control module contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures and an output which supplies battery power to the external seat air pump motor when any of the air bladders require inflating.

Based on the LIN command from the seat memory control module, the seat bolster memory control module controls the appropriate air solenoids and activates or deactivates the external air pump in order to inflate or deflate the air bladders in the correct combination. When an air bladder needs inflating its solenoid opens and the pump motor is activated pumping air into the bladder. When an air bladder needs deflating its solenoid opens the release valve and air is allowed to bleed out of the bladder into the vehicle cabin.

To support memory recall and massage, the seat bolster memory control module uses internal air pressure sensors to track, store and recall the positions of all the air bladders under its control.

The massage On/Off switch on the LIN seat switch allows the customer to turn the massage feature on and off without having to go back into the seat feature menu for set-up.

Refer to Seat Adjustment in the Owner's Manual for the up level seat adjustment features listed above.

MEMORY SEATS DESCRIPTION AND OPERATION

The driver and passenger memory seat system each consist of the following components:

- Seat memory control module
- Seat adjuster switch
- Seat memory switch
- Seat horizontal motor
- Seat front vertical motor
- Seat rear vertical motor
- Seat recline motor
- Upper seat back motor
- Seat lumbar horizontal motor (If equipped)
- Seat horizontal motor position sensor
- Seat front vertical motor position sensor
- Seat rear vertical motor position sensor
- Seat recline motor position sensor
- Upper seat back motor position sensor
- Seat lumbar horizontal motor position sensor (If equipped)

Seat Adjuster Switches

The seat adjuster switch communicates all requests for seat movement or adjustment via the LIN serial data bus to the seat memory control module. Manipulating the seat cushion and seat back control bar results in the seat memory control module responding in the same way as it would if the resultant requests were made by discrete signals instead of the LIN messaging this switch employs. For the seat adjuster switch description and operation, refer to [Lumbar Support Description and Operation \(2-Way with Memory A45\)](#) and/or [Lumbar Support Description and Operation \(With Seat Bolster Memory Control Module\)](#).

Seat Memory Control Module Power and Grounds

Battery positive voltage is supplied at all times to the driver and passenger seat memory control modules through separate 30 A fuse located in the rear body fuse block. This voltage is used by the module to apply power to the seat and lumbar motors when commanded ON. Battery positive voltage is also applied at all times to both the driver and passenger seat memory control modules through a 10 A fuse also located in the rear body fuse block. This voltage is used to power up the control modules. Ground is provided to the seat memory control module through a single ground circuit and ground connection.

Seat Motors

There is a possibility of up to 6 motors that move the position of the seat. These are the seat horizontal motor, seat front vertical motor, seat rear vertical motor, seat back recline motor, upper seat back motor and the lumbar horizontal motor. The seat horizontal motor moves the entire seat forward and rearward. The seat front vertical motor tilts the front of the seat cushion up or down. The seat rear vertical motor moves the seat cushion up and down. Due to the seat adjuster switch design the front tilt and the seat height adjuster motor cannot be operated at the same time. The recline motor moves the angle of the seat back forward or rearward. The upper seat back motor is separate from the seat back recline motor. It is a mechanical motor that moves the upper seat back cushion position forward or rearward. If equipped, the seat lumbar horizontal motor moves the lumbar support forward and rearward.

The seat memory control module controls all seat motors via half bridges that are connected to a single power rail internal to the module. The module connects all seat motor outputs to a common ground whenever they are not in operation. The module checks to see if any motor control circuits are shorted to ground or voltage before enabling any seat motor. All of the motors operate independently of each other. Each motor contains an electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

All seat motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, ground is applied through the switch contacts onto the seat horizontal forward switch signal circuit to the seat memory control module. In response to this signal, the module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs in order to drive the entire seat forward. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. All of the motors are powered this way.

Seat Hall-Effect Position Sensors

To monitor seat position, each seat motor has an internal 2-wire hall-effect position sensor. The seat memory control module supplies all the sensors with a common 12 V reference when the seat is moving and a unique signal circuit for each sensor. During seat motor operation, the position sensors provide a specific number of pulse signals for every revolution of the motor shaft.

The seat memory control module determines seat position by keeping a running counter where movement in the forward/upward direction adds counts and movement in the rearward/down direction subtracts counts. The value of the counter will be in the range of 0 - 65,535.

The value of these counters, which represent seat positions, are stored in memory for future seat memory recall operation. During a memory seat position recall, the seat memory control module moves the seat in such a way to return it to the stored counter value.

Seat Lumbar Position Sensor

The seat lumbar horizontal position sensor is a potentiometer which is an internal part of the motor. The seat memory control module supplies a 5 V reference and a low reference circuit to the sensor. When the motor rotates, the resistance of the potentiometer varies changing the feedback voltage of the position sensor signal circuit. The voltage varies from 0.22 - 4.75 V. The control module monitors this voltage signal to determine the position of the lumbar. When a memory set command is received, the control module records the lumbar position by storing the feedback voltage from the sensor. Then when a memory recall command is received, the control module moves the lumbar motor until the position sensor feedback voltage equals the feedback voltage stored in memory.

Memory Functions

In all power modes except crank, memory recalls can be initiated by pressing and holding one of the memory position buttons until the seat reaches the stored memory position associated with the activated button. This is called a supervised recall.

The seat memory control module supplies a ground at all times through a low reference circuit to the seat memory switch. The module also supplies memory set and memory recall signal circuits to the seat memory switch. When a memory recall switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and a series of resistors indicating the memory

recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Refer to Memory Seats in the Owner's Manual for storing memory positions.

Auto Memory Recall and Easy Exit - Driver Seat Only

The Driver seat memory control module will not perform Auto Memory Seat Recall and Easy Exit functions unless these options are enabled in vehicle personalization using the radio/HVAC controls.

Refer to Instruments and Controls/Vehicle Personalization in the Owner's Manual for the following memory personalization options:

- Auto Memory Recall
- Easy Exit Options

The radio/HVAC controls reports the auto memory recall option settings to the driver seat memory control module via serial data message. The module will then store the memory recall option setting and examine it before making a memory seat adjustment. The auto memory recall option setting stored within the module will not change until the auto memory recall option setting in vehicle personalization is changed.

POWER SEATS SYSTEM DESCRIPTION AND OPERATION (REAR SEAT)

The left and right rear power seat system each consist of the following components:

- Seat memory control module
- Seat adjuster switch
- Seat memory switch
- Seat horizontal motor
- Seat front vertical motor
- Upper seat back motor
- Seat horizontal motor position sensor
- Seat front vertical motor position sensor
- Upper seat back motor position sensor

The rear power seats are each controlled by their own seat memory control module. These modules are similar to the front passenger seat memory control module with modified functionality as described below. This includes the use of LIN serial data seat adjuster switches and seat bolster memory control modules.

The rear power seat systems provides for the possibility of the following functionality:

- Seat horizontal movement
- Seat cushion front vertical movement
- Upper seat back horizontal movement
- Lumbar and massage
- Rear seat exit recall
- Auto rear seat exit recall
- Child lockout features

Seat Cushion Horizontal, Front Vertical and Upper Seat Back Function

The rear seat memory control module specifics for rear seat horizontal movement and front cushion vertical movement are basically the same as that of the front passenger seat. With one exception, if the module receives a switch request for seat horizontal movement in the forward direction, the seat cushion will move forward and the front of the seat cushion will move in the upward direction.

Likewise, if the module receives a switch request for seat horizontal movement in the rearward direction, the seat cushion will move rearward and the front of the seat cushion will move in the

downward direction.

With the ignition ON, upper seat back adjustments are made by first using the rotary ring on the seat adjuster switch to select the function through the HMI display. Then the forward and rearward buttons on the 4-way multi-function switch are used to reach the desired upper seat back position.

During this operation, if a single motor stall occurs (a motor reached its end of travel), the module will not abort the other motor movement that is not stalled. Similar to the passenger seat memory control module, the hall effect position sensors are used to determine when a motor stall has occurred, refer to Seat Position Sensors description below.

Seat Adjuster Switch

The rear seat adjuster switch communicates all requests for rear seat movement or adjustment via the LIN serial data bus to the seat memory control module. Manipulating the seat cushion and seat back control bar results in the seat memory control module responding in the same way as it would if the resultant requests were made by discrete signals instead of the LIN messaging this switch employs. For the seat adjuster switch description and operation, refer to [Lumbar Support Description and Operation \(2-Way with Memory A45\)](#) and/or [Lumbar Support Description and Operation \(With Seat Bolster Memory Control Module\)](#).

Seat Memory Control Module Power and Grounds

Battery positive voltage is supplied at all times to the driver and passenger seat memory control modules through separate 30 A fuses located in the rear body fuse block. This voltage is used by the module to apply power to the seat motors when commanded ON. Battery positive voltage is also applied at all times to both the driver and passenger seat memory control modules through a 10 A fuse also located in the rear body fuse block. This voltage is used to power up the control modules. Ground is provided to the seat memory control module through a single ground circuit and ground connection.

Seat Motors

There are 3 motors that move the position of the rear seat. These are the seat horizontal motor, seat front vertical motor and the upper seat back motor. The horizontal motor moves the entire seat forward and rearward. The seat front vertical motor moves the front of the seat cushion up or down. The upper seat back motor moves the upper seat back forward or rearward.

The seat memory control module controls all seat motors via half bridges that are connected to a single power rail internal to the module. The module connects all seat motor outputs to a common ground whenever they are not in operation. The seat memory control module checks to see if any motor control circuits are shorted to ground or voltage before enabling any seat motor. All of the motors operate independently of each other. Each motor contains an electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

All seat motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, a serial data message is sent from the seat adjuster switch to the seat memory control module indicating the seat horizontal forward command. In response to this message, the module applies battery voltage through the seat horizontal motor forward control circuit and ground through the seat horizontal motor rearward control circuit to the motor. The motor runs in order to drive the entire seat forward. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. All of the motors are powered this way.

Seat Position Sensors

The purpose of the seat position sensors is to notify the rear seat memory control module when a motor has stalled or reached its seat exit position. Each seat motor has an internal 2-wire hall-effect position sensor. The module supplies the sensors with a common 12 V reference when the seat is moving and a unique signal circuit for each sensor. During seat motor operation, the position sensors provide a specific number of pulse signals for every revolution of the motor shaft. The module monitors the pulse signals from each sensor to determine when the seat has reach its exit position. This exit position is a factory predetermined position and not a customer stored position. The rear seat memory control modules do not support operator stored memory positions thus there are no SET, Memory 1 and Memory 2 switches.

Rear Seat Exit Position Recall

The exit position may be recalled by a supervised exit switch activation or by an auto recall.

When an exit position recall is initiated, the control module will make the following seat adjustments to move the seat to its exit position:

- The seat cushion front vertical will move to the full down position
- The seat will move horizontally to the full rearward position
- The upper seat back adjustment will move to the full rearward position

Rear Seat Exit Switch

The exit recall Switch is located with the rear heated seat switches. A low reference circuit is supplied to the rear seat exit switch from the seat memory control module. When the exit switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and series of resistors indicating the memory exit request. In response to this signal, the seat memory control module commands the rear seat motors to move to the full down and rearward seat positions.

Door Ajar Exit Position Recall

When a rear seat memory control module associated with a specific seating location receives a GMLAN message from the BCM indicating that its associated door is "Ajar", the Module will initiate an exit position recall.

Front Seat Initiated Rear Seat Exit Position Recall

The left rear seat memory control module will execute an "Ignition On Rear Seat Exit Position Recall" when the front seats perform a memory recall causing seat horizontal rearward, seat back recline rearward or cushion down movement as a result of the vehicle personalization set to initiate a front seat memory recall at Ignition On. The rear seat exit position recall is initiated by the reception of a GMLAN message indicating the correct criteria has been met.

The left rear seat memory control module will execute an "Rear Seat Easy Exit Position Recall" when the front seats perform a memory recall causing front seat horizontal rearward, seat back recline rearward or cushion down movement as a result of the vehicle personalization set to initiate a front seat memory easy exit recall. The rear seat exit position recall is initiated by the reception of a GMLAN message indicating the correct criteria has been met.

Child Lockout Switch Seat Adjustment Restriction

The rear seat memory control modules receives the Child Lock Out Switch status from the BCM over the GMLAN serial data bus. If the child lock out switch is deemed to be active the rear seat memory control modules will inhibit/disable functionality related to manual seat movement, rear seat exit position recalls initiated with the rear seat exit switch or the rear seat auto recalls, lumbar, massage/bolster.
